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Vol. 964 Number 5

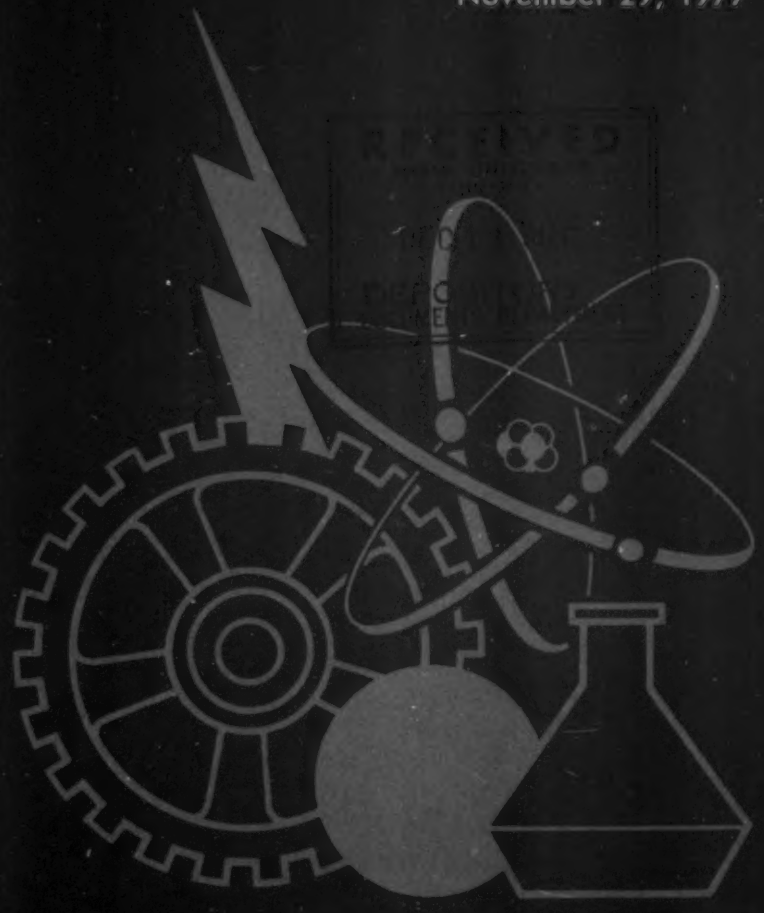
OFFICIAL GAZETTE

of the

UNITED STATES PATENT AND TRADEMARK OFFICE

PATENTS

November 29, 1977



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OFFICIAL GAZETTE of the UNITED STATES PATENT and TRADEMARK OFFICE

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PATENT AND TRADEMARK OFFICE NOTICES

August and September 1977 Classification Orders

The reclassifications covered by the following classification changes became effective between August and September 1977.

	Class	Subclasses
Classification Order 594, effective August 2, 1977:		
Abolished	260	240-249.9; 309-312; 343.2; 346.1; 346.2; 346.8; 348-348.6.
Established	260	242.2; 243.3; 343.21; 343.41-343.45; 346.11; 346.22; 346.71-346.76; 347.91; 348.11-349.19; 348.21-348.29; 348.31-348.39; 348.41-348.49; 348.51-348.59; 348.61-348.64.
	(New) 542	400-476.
	(New) 544	1-223.
	(New) 548	300-379.
Title change	260	239.
Classification Order 595, effective August 2, 1977:		
Abolished	310	2-9.8.
Established	310	300-371; 800.
Classification Order 596, effective August 2, 1977:		
Abolished	206	498.
	229	51; 66; 85 and 86.
Established	206	601-634.
Classification Order 597, effective September 6, 1977:		
Abolished	181	33-72.
Established	181	200-296; 403; 404.
Title change	181	198.
Classification Order 598, effective September 6, 1977:		
Abolished	29	95; 95.1; 96; 97; 97.5; 98; 101-106; 567.
Established	(New) 407	1-120.
	408	203.5.
Classification Order 599, effective September 6, 1977:		
Abolished	260	468-499.
Established	(New) 560	1-266.
Classification Order 600, effective September 27, 1977:		
Abolished	330	12-40.
Established	330	250-311.
Classification Order 601, effective September 27, 1977:		
Abolished	164	273-283.
Established	164	413-450.
Title change	164	267.
Classification Order 602, effective September 27, 1977:		
Abolished	137	608-612.1.
Established	137	861-887.
Classification Order No. 603, effective September 27, 1977:		
Abolished	106	1.
Established	106	1.05; 1.11-1.19; 1.21-1.29.
Classification Order No. 604, effective September 27, 1977:		
Abolished	425	455.
Established	425	403.1.

ALFRED C. MARMOR,
Administrator for Documentation,
October 27, 1977.

Withdrawal From Practice

On August 19, 1977, Eugene V. Mandel of 311 W. 24th Street, Apt. 3D, New York, N.Y. 10011 withdrew from further practice before the United States Patent and Trademark Office. Accordingly, his name has been removed from the Register of Patent Attorneys and Patent Agents, effective August 19, 1977.

LUTRELLE F. PARKER,
Acting Commissioner of Patents and Trademarks
and Chairman, Committee on Enrollment.

Patent Suits

Notices under 35 U.S.C. 290; Patent Act of 1952

2,807,016, P. F. M. Gloess, SOUNDING DEVICE USING ELECTROMAGNETIC WAVES, **filed** Aug. 14, 1973, United States Court of Claims (District of Columbia), Doc. 263-73, *International Telephone and Telegraph Corporation and International Standard Electric Corporation* v. *The United States and American Marine Defense Electronics Corporation (formerly Ridge Electronics Corporation), Texas Instruments, Inc. and Sperry-Rand Corporation.* Judgment is entered for plaintiff, July 14, 1977.

2,900,384, M. F. Saxton, MAGNETIC DOOR CATCH, **filed** Jan. 10, 1975, D.C., N.D. Ill. (Chicago), Doc. 75c99, *Engineered Products Co.* v. *Richard K. Sweet and Assoc.* Cause dismissed with prejudice pursuant to stipulation, July 26, 1977.

2,968,164, A. W. Hanson, METHOD OF GENERATING SNOW, **filed** June 20, 1977, D.C.N.J. (Newark), Doc. 77-1204, *Alden W. Hanson* v. *Hedco, Inc.*

3,166,154, J. M. Titzel, PORTABLE SCAFFOLDS AND WORK TOWERS, **filed** Dec. 9, 1976, D.C., W.D. Pa. (Pittsburgh), Doc. 76-1541, *Fordees Corporation* v. *Vulcan, Inc.* Defendant's motion for summary judgment is granted, June 20, 1977.

3,192,198, Naylor and Smith, PENICILLINS, **filed** July 19, 1977, D.C. Del. (Wilmington), Doc. 77-274, *Beecham Group Limited* v. *Bristol-Myers Co.*

3,211,167, Clift and Snyder, APPARTUS FOR TRANSPORTING SEWAGE AND WASTE LIQUIDS, **filed** Apr. 23, 1976, United States Court of Claims (District of Columbia), Doc. 163-76, *Julia Ann Clift* v. *The United States.* Order, plaintiff's petition is dismissed for lack of prosecution, June 10, 1977.

3,214,836, R. F. West, COILABLE RULE; **3,216,117,** A. L. Stowell, same, **filed** July 11, 1977, D.C., S.D. Calif. (San Diego), Doc. 77-0469-GT, *The Stanley Works* v. *Stephen J. Watson, doing business as Tools-R-Us.*

3,216,117. (See 3,214,836.)

3,308,839, D. J. Barday, APPARATUS FOR CLEANING OBJECTS WITH SOLVENT, **filed** May 24, 1977, D.C. Colo. (Denver), Doc. 77-0504, *Donald James Barday* v. *Detrex Chemical Industries, Inc.*

3,310,824, C. C. Beer, VEHICLE WASHER, **filed** June 6, 1977, D.C., W.D. Pa. (Pittsburgh), Doc. 77-661, *Sherman Industries, Inc.* v. *N/S Car Wash Enterprises, Inc.*

3,341,021, K. H. Casson, MAGNETIC SEPARATOR, **filed** Sept. 9, 1976, D.C., N.D. Ill. (Chicago), Doc. 76c3358, *Barnes Drill Co.* v. *Chemaperm Magnetics Inc.* Cause dismissed on stipulation, June 15, 1977.

3,343,264, N. F. Guichet, DENTAL ARTICULATOR AND METHOD OF USE; **3,350,782,** same, DENTAL APPARATUS AND METHOD, **filed** June 29, 1977, D.C., C.D. Calif. (Los Angeles), Doc. CV77-2408-RJK, *Niles F. Guichet and Denar Corp.* v. *U.S. Shizai Corp.*

3,344,933, Jelatis and Chesley, REMOTE CONTROL CRANE SYSTEM, **filed** Feb. 22, 1977, D.C. Iowa (Cedar Rapids), Doc. C-77-9, *Highway Equipment Company* v. *Dickey-John Corporation.* Defendant shall not hereafter make, use or sell structures coming within scope of one or more claims of said patent unless pursuant to license or other agreement with plaintiff, July 11, 1977.

3,350,782. (See 3,343,264.)

3,384,037, K. A. Blevins, SEWING-MACHINE TABLE, **filed** July 18, 1977, D.C., W.D. Wash. (Seattle), Doc. C77-528M, *Bascorp* v. *Northwest Sales & Manufacturing Corporation.*

3,398,745, Tjerneld and Hook, DEVICE FOR THE TAPPING OF URINE AND SIMILAR PURPOSES, **filed** July 15, 1977, United States Court of Claims (District of Columbia), Doc. 381-77, *Aktiebolaget Stille-Werner* v. *The United States.*

3,418,990, A. W. Lindell, IGNITION SYSTEM ISOLATION CIRCUIT FOR INTERNAL COMBUSTION ENGINES AND THE LIKE; **3,461,851,** J. B. Stephens, IGNITION SYSTEM AND MAGNETO THEREFOR; **Re. 28,392,** B. E. McMillen, MAGNETO IGNITION SYSTEM FOR INTERNAL COMBUSTION ENGINES AND THE LIKE, **filed** July 12, 1977, D.C., W.D. Wis. (Madison), 77–C–262, *AMBAC Industries, Incorporated* v. *Colt Industries, Inc.*

3,461,851. (See 3,418,990.)

3,514,074, R. E. Self, HIGH ENERGY LOSS FLUID CONTROL, **filed** July 18, 1977, D.C., C.D. Calif. (Los Angeles), Doc. CV77–2659–R, *Control Components, Inc.* v. *Sargent Industries, Inc.*

3,522,814, G. R. Olson, WASHER FOR PARTS AND THE LIKE, **filed** June 1, 1977, D.C. La. (New Orleans), Doc. 77–1721 (C.A.), *Safety-Kleen Corporation* v. *Tommy Breaux et al.*

3,528,600, R. C. Price, SAMPLE DISPLAY FIXTURE, **filed** June 19, 1975, D.C.N.J. (Newark), Doc. 75–1079, *Congoleum Industries, Inc.* v. *Raymond C. Price and Royal Engineering Company.*

3,583,596, C. T. Brewer, Ltd; **Re. 28,797,** same, **filed** July 7, 1977, D.C.. N.D. Ill. (Chicago), Doc. 77c2441, *Solo Cup Corporation* v. *Sweetheart Cup Corporation.*

3,590,865, M. Bremshey, FLAT UMBRELLA, **filed** Jan. 11, 1977, D.C., N.D. Ga. (Atlanta), Doc. C77–47A, *Knirps Canada Ltd. and Knirps Canada Ltee* v. *Atlanta Umbrella Company, Inc.* Final judgment on consent, June 30, 1977.

3,649,401, D. B. Gunnerson, METHOD OF MAKING CONTINUOUS FIBERGLASS · FILAMENT OPEN WEAVE FRAMES AND STRUCTURES, **filed** June 6, 1977, D.C. Ariz. (Phoenix), Doc. 77–443–Phx WPC, *Dale B. Gunnerson and Geostrand Products, Inc.* v. *Craft Originals, Inc. and Arizona Commonwealth Corporation et al.*

3,667,449, B. D. Williams, WRIST WATCH ASSEMBLY, **filed** Apr. 23, 1976, D.C., N.D. Ala. (Birmingham), Doc. CA 76–L–0580–NE, *Bill D. Williams* v. *Service Merchandise Co. No. 2½, Inc.* Order that said patent issued to Bill D. Williams is void because anticipated by the prior art or in the alternative, because its claimed invention was obvious to one skilled in the art of the design or manufacture of watch bands. This action is dismissed with prejudice, July 27, 1977.

3,672,187, E. C. Simpson, FABRIC, **filed** Apr. 18, 1975, D.C., S.D.N.Y., Doc. 75–C–1886, *Polylok Corporation* v. *Disto Textilwerk GmbH.* Consent decree, defendant is hereby enjoined from further infringement of said patent, and all claims and counterclaims are dismissed with prejudice, June 17, 1977.

3,723,273, H. P. Wilson, ELECTRODIALYTIC PRODUCTION OF STANNIC OXIDE SOL, **filed** July 11, 1977, D.C., W.D. Pa. (Pittsburgh), Doc. 77–813, *Pitt Metals & Chemicals Inc.* v. *Vulcan Materials Company.*

3,736,685, R. Shibata, ADHESIVE SHEET MATERIAL, **filed** July 29, 1977, D.C., S.D. Fla. (Miami), Doc. 77–2342–C–WMH, *Desmarais & Frere, Ltd. and Ryoji Shibata* v. *J. & M. Enterprises (U.S.A.), Inc. and Al Nyman & Son, Inc.*

3,743,561, Koontz, Heitkamp and Jackson, MANUFACTURE OF FIBER REINFORCED POLYMER ARTICLES, **filed** June 9, 1977, United States Court of Claims (District of Columbia), Doc. 326–77, *EFMC Corporation* v. *The United States of America.*

3,801,104, Potts and Word, BOARD GAME APPARATUS, **filed** July 27, 1977, D.C., E.D.N.Y. (Brooklyn), Doc. 77–C–1531, *Vantage Point, Inc.* v. *Parker Brothers, Inc. et al.*

3,874,258, Semola and Droesbeke, KEYED ATTACHMENT DEVICE FOR VEHICLE WHEELS, **filed** July 6, 1977, D.C., C.D. Calif. (Los Angeles), Doc. CV77–2489–RJK, *Stallion Enterprises, Inc.* v. *Kyoei American Corporation.*

3,923,176, Wynn and Butler, FIRST TABLE FOR A BALE WAGON, **filed** July 27, 1977, D.C., S.D.N.Y., Doc. 77–C–3600, *Hunter Wolfe* v. *Sperry Rand Corporation.*

3,929,049, C. L. Graversen, EXTENDED PITCH SAW CHAIN, **filed** Jan. 27, 1976, D.C. Oreg. (Portland), Doc. 76–87, *Omark Industries, Inc.* v. *Sabre Saw Chain (1963) Limited, Handyman Home Center, Inc. and G. I. Joes, Inc.* Stipulation for dismissal filed July 15, 1977.

3,958,294, D. E. Thompson, ROTARY SCRAPER, **filed** July 12, 1977, D.C. Conn. (Bridgeport), Doc. B–77–208, *Thompson Tool Co., Inc.* v. *Milton Rosembaum et al.*

3,962,125, D. Armstrong, MULTI-PURPOSE DILUENT FOR USE IN BLOOD ANALYSIS BY ELECTRONIC INSTRUMENTATION OF THE COULTER TYPE, **filed** June 1, 1977, D.C., N.D. Ill. (Chicago), Doc. 77c1941, *Coulter Electronics, Inc.* v. *J. T. Baker Chemical Corporation, Ipco Hospital Supply Corp. and Rupp & Bowman Company.*

3,968,985, Nielsen, Jr. and Morse, LOCKS FOR ELECTRIC METER BOXES, **filed** June 28, 1977, D.C. Mass. (Boston), Doc. 77–1892–M, *Omco, Inc.* v. *E. J. Brooks Co.*

3,994,415, A. M. Hodge, TRASH CONTAINER LID SYSTEM, **filed** June 17, 1977, D.C., C.D. Calif. (Los Angeles), Doc. CV77–2247–FW, *Balanced Lid Systems, Inc. and Allan Hodge* v. *Consolidated Fabricators Corp.*

4,015,299, R. Tinnel, WATER BED, **filed** July 22, 1977, D.C., N.D. Calif. (San Francisco), Doc. C–77–1585WAI, *Robert Tinnel and Ultimate Waterbed Co.* v. *Intimate Sleep Products and Gordon Weatherly & Associates.*

4,022,028, C. F. Martin, SUBMARINE PIPE TRENCHING APPARATUS, **filed** June 22, 1977, D.C., W.D. La. (Shreveport), Doc. 770670–L, *Charles F. Martin* v. *Norman Industries, Inc. and Robert M. Norman.*

4,037,476, J. McCrabb, GRAIN SAMPLING PROBE, **filed** July 28, 1977, D.C., S.D. Iowa (Des Moines), Doc. 77–223–2, *McCrabb Bros. Mfg. Inc.* v. *M.M.C. Enterprises, Inc. and Larry Martin.*

Re. 25,338, D. L. Olson, PRESSURE-OPERATED VALVE WITH MAGNETICALLY ACTUATED PILOT, **filed** May 12, 1977, D.C.N.J. (Newark), Doc. 77–0912, *Marotta Scientific Controls, Inc.* v. *Valcor Engineering Corp.* Plaintiff's notice of voluntary dismissal of action, May 16, 1977.

Re. 25,536, D. T. Thompson, APPARATUS FOR MAKING AN ANNULUS, **filed** June 18, 1976, D.C., N.D. Ohio (Cleveland), Doc. C 76–608, *Thompson Bagel Machine Manufacturing Corp.* v. *Amster Bagel Machine Co., Inc.* This action is dismissed with prejudice, June 6, 1977.

Re. 28,392. (See 3,418,990.)

Re. 28,797. (See 3,583,596.)

D. 227,352, Meng and Driessen, PACKAGE WITH STAGGERED PRODUCT SLICES, **filed** Mar. 16, 1976, D.C., E.D. Wis. (Milwaukee), Doc. 76–189, *L. D. Schreiber Cheese Company, Inc.* v. *Land-O-Lakes, Inc. and Palmer Manufacturing Corporation.*

D. 235,779, K. Barr, PHASING SIMULATOR FOR MUSICAL INSTRUMENT; **Reg. No. 996,083** (PHASE 90), MXR Innovations, **filed** Apr. 15, 1977, D.C. Colo. (Denver), Doc. 77–M–370, *MXR Innovations, Inc.* v. *Ross Musical Products, Inc., Gunilla M. Ross and I. B. and D. E. Lusty.* Defendant is permanently enjoined from infringing upon plaintiff's said design patent and trademark, entered June 7, 1977.

D. 244,161, I. Friedman, SEAT; **D. 244,329,** same, CHAIR, **filed** June 27, 1977, D.C., C.D. Calif. (Los Angeles), Doc. CV77–2369–MM, *Rowe Furniture Corp.* v. *Chairmakers, Inc. et al.*

D. 244,329. (See D. 244,161.)

Reg. No. 996,083. (See D. 235,779.)

REISSUE APPLICATIONS FILED

Notice under 37 CFR 1.11(b). The reissue applications listed below are open to inspection by the general public in the indicated Examining Groups and copies may be obtained by paying the fee therefor (37 CFR 1.21(b)).

3,547,811 Re. S.N. 836,757, Filed Sept. 26, 1977, Cl. 210/7, CYCLIC OXYGENATION OF BOD-CONTAINING WATER, John R. McWhirter, Owner of Record: *Union Carbide Corporation, New York, N.Y.* Attorney or Agent: Harrie M. Humphreys, et al., Ex. Gp.: 176

3,547,812, Re. S.N. 836,740, Filed Sept. 26, 1977, Cl. 210/7, HIGH OXYGEN UTILIZATION IN BOD-CONTAINING WATER TREATMENT, John R. McWhirter, Owner of Record: *Union Carbide Corporation, New York, N.Y.* Attorney or Agent: Harrie M. Humphreys, et al., Ex. Gp.: 176

3,968,867, Re. S.N. 806,082, Filed Sept. 26, 1977, Cl. 197/1 R, INFORMATION TRANSMISSION DEVICE FOR POINT CONTACT ON AN INFORMATION CARRIER, Sven Gunnar Valter Stenudd, Owner of Record: *Inventor,* Attorney or Agent: Alfred E. Miller, Ex. Gp.: 337

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PATENT NOTICES

Certificates of Correction for the Week of Nov. 29, 1977

P.P. 4,049	3,997,835	4,017,872	4,028,344	4,034,381	4,037,995	4,040,114	4,043,810
D. 242,614	3,999,715	4,018,781	4,028,345	4,034,481	4,037,999	4,040,308	4,043,812
D. 244,038	3,999,947	4,018,797	4,028,611	4,034,658	4,038,042	4,040,339	4,043,831
3,901,886	4,000,120	4,018,938	4,028,656	4,034,886	4,038,177	4,040,418	4,043,886
3,911,242	4,000,164	4,019,764	4,028,680	4,034,977	4,038,248	4,040,580	4,044,095
3,919,469	4,003,024	4,020,018	4,028,847	4,035,039	4,038,253	4,040,610	4,044,403
3,926,685	4,003,434	4,020,056	4,029,165	4,035,124	4,038,261	4,040,648	4,044,438
3,927,091	4,004,552	4,020,359	4,029,872	4,035,281	4,038,397	4,040,797	4,044,462
3,935,621	4,004,648	4,020,632	4,029,874	4,035,407	4,038,413	4,040,819	4,044,496
3,938,228	4,006,864	4,021,311	4,029,995	4,035,420	4,038,447	4,040,858	4,044,575
3,938,354	4,006,868	4,021,412	4,030,352	4,035,659	4,038,530	4,040,888	4,044,811
3,939,286	4,008,143	4,021,434	4,030,438	4,035,720	4,038,540	4,040,902	4,044,877
3,939,959	4,008,318	4,021,826	4,030,546	4,035,864	4,038,762	4,041,122	4,044,941
3,949,291	4,008,323	4,022,209	4,030,579	4,036,072	4,038,781	4,041,669	4,044,945
3,961,044	4,008,372	4,022,481	4,030,583	4,036,522	4,038,810	4,042,104	4,045,015
3,972,776	4,009,126	4,022,569	4,031,285	4,036,579	4,038,871	4,042,116	4,045,025
3,981,131	4,009,852	4,022,711	4,031,744	4,036,620	4,038,949	4,042,197	4,045,191
3,984,926	4,011,181	4,022,809	4,032,015	4,036,633	4,039,017	4,042,354	4,045,341
3,988,353	4,011,196	4,023,276	4,032,073	4,036,808	4,039,026	4,042,401	4,045,415
3,988,748	4,011,491	4,023,462	4,032,432	4,036,874	4,039,350	4,042,459	4,045,507
3,989,216	4,011,637	4,024,038	4,032,914	4,037,289	4,039,394	4,042,680	4,045,513
3,989,580	4,012,431	4,024,150	4,033,678	4,037,313	4,039,417	4,042,694	4,045,527
3,989,825	4,012,617	4,024,470	4,033,808	4,037,365	4,039,509	4,042,708	4,045,912
3,990,240	4,013,787	4,025,545	4,033,923	4,037,367	4,039,538	4,042,773	
3,991,775	4,016,174	4,025,664	4,033,933	4,037,372	4,039,545	4,043,378	
3,992,760	4,016,435	4,027,722	4,033,959	4,037,583	4,039,691	4,043,614	
3,995,755	4,017,457	4,028,214	4,034,082	4,037,736	4,039,862	4,043,706	
3,995,973	4,017,469	4,028,330	4,034,238	4,037,829	4,039,906	4,043,738	

Disclaimers

3,430,365.—*John F. Dee, Jr.*, Notre Dame, Ind. LOW CUT SPORTS SHOE. Patent dated Mar. 4, 1969. Disclaimer filed Sept. 19, 1977, by the inventor.

Hereby enters this disclaimer to claims 2, 3 and 4 of said patent.

3,637,145.—*Robert M. Williams*, Ladue, Mo. REVERSIBLE MATERIAL REDUCING MILL. Patent dated Jan. 25, 1971. Disclaimer filed Sept. 19, 1977, by the assignee, *Williams Patent Crusher and Pulverizer Co., Inc.*

Hereby enters this disclaimer to all claims of said patent.

3,725,093.—*Richard D. Sanner*, Sylvania, Ohio. HIGH LEAD CONTENT GLASS COMPOSITION FOR TELEVISION NECK TUBES. Patent dated Apr. 3, 1973. Disclaimer filed Sept. 22, 1977, by the assignee, *Owens-Illinois, Inc.*

Hereby enters this disclaimer to claims 1 through 8 of said patent.

3,840,926.—*Helmut Stoeberl*, Eggstaett-Bachham, Germany. BOAT HULL. Patent dated Oct. 15, 1974. Disclaimer filed Oct. 5, 1977, by the assignee, *Klepper-Werke Kommanditgesellschaft.*

Hereby enters this disclaimer to claims 1, 5, 12 and 13 of said patent.

PATENT EXAMINING CORPS

RENE D. TEGTMEYER, Assistant Commissioner

WILLIAM FELDMAN, Deputy Assistant Commissioner

CONDITION OF PATENT APPLICATIONS AS OF OCTOBER 8, 1977

PATENT EXAMINING GROUPS	Actual Filing Date of Oldest New Case Awaiting Action
CHEMICAL EXAMINING GROUPS	
GENERAL CHEMISTRY AND PETROLEUM CHEMISTRY, GROUP 110—S. N. ZAHARNA, Director. Inorganic Compounds; Inorganic Compositions; Organo-Metal and Organo-Metalloid Chemistry; Metallurgy; Metal Stock; Electro Chemistry; Batteries; Hydrocarbons; Mineral Oil Technology; Lubricating Compositions; Gaseous Compositions; Fuel and Igniting Devices.	6-22-76
GENERAL ORGANIC CHEMISTRY, GROUP 120—A. L. LEAVITT, Director. Heterocyclic, Amides; Alkaloids; Azo; Sulfur; Misc. Esters; Carbohydrates; Herbicides; Poisons; Medicines; Cosmetics; Steroids; Oxo and Oxy; Quinones; Acids; Carboxylic Acid Esters; Acid Anhydrides; Acid Halides.	1-3-77
HIGH POLYMER CHEMISTRY, PLASTICS AND MOLDING, GROUP 140—A. P. KENT, Director. Synthetic Resins; Rubber; Proteins; Macromolecular Carbohydrates; Mixed Synthetic Resin Compositions; Synthetic Resins With Natural Polymers and Resins; Natural Resins; Reclaiming; Pore-Forming; Compositions (Part) e.g.: Coating; Molding; Ink; Adhesive and Abrading Compositions; Molding, Shaping, and Treating Processes.	2-1-77
COATING AND LAMINATING, BLEACHING, DYEING AND PHOTOGRAPHY, GROUP 160—R. FRIEDMAN, Director. Coating; Processes and Misc. Products; Laminating Methods and Apparatus; Stock Materials; Adhesive Bonding; Special Chemical Manufactures; Special Utility Compositions; Bleaching; Dyeing and Photography.	10-22-76
SPECIALIZED CHEMICAL INDUSTRIES AND CHEMICAL ENGINEERING, GROUP 170—H. S. VINCENT, Director. Fertilizers; Foods; Fermentation; Analytical Chemistry; Reactors; Sugar and Starch; Paper Making; Glass Manufacture; Gas; Heating and Illuminating; Cleaning Processes; Liquid Purification; Distillation; Preserving; Liquid, Gas, and Solid Separation; Gas and Liquid Contact Apparatus; Refrigeration; Concentrative Evaporators; Mineral Oils Apparatus; Misc. Physical Processes.	10-27-76
ELECTRICAL EXAMINING GROUPS	
INDUSTRIAL ELECTRONICS, PHYSICS AND RELATED ELEMENTS, GROUP 210—W. L. CARLSON, Director. Generation and Utilization; General Applications; Conversion and Distribution; Heating and Related Art Conductors; Switches; Photography; Motion Pictures; Illumination; Horology; Acoustics; Recorders; Weighing Scales.	8-18-76
SPECIAL LAWS ADMINISTRATION, GROUP 220—C. D. QUARFORTH, Director. Ordnance, Firearms and Ammunition; Radar, Underwater Signalling, Directional Radio, Torpedoes, Seismic Exploring, Radio-Active Batteries; Nuclear Reactors, Powder Metallurgy, Rocket Fuels; Radio-Active Material.	6-15-76
INFORMATION TRANSMISSION, STORAGE AND RETRIEVAL, GROUP 230—J. F. COUCH, Director. Communications; Multiplexing Techniques; Facsimile; Data Processing, Computation and Conversion; Storage Devices and Related Arts.	1-7-77
RECEPTACLES, SANITATION AND CLEANING, WINDING, AND MEASURING, GROUP 240—N. ANSHER, Director. Receptacles; Joint Packing; Conduits; Plumbing Fixtures; Textile Spinning; Food; Agitating; Cleaning; Pressing; Geometrical Instruments; Sound Recording; Winding and Reeling; Measuring and Testing; Indicating.	10-12-76
ELECTRONIC COMPONENT SYSTEMS AND DEVICES, GROUP 250—L. FORMAN, Director. Semi-Conductor and Space Discharge Systems and Devices; Electronic Component Circuits; Wave Transmission Lines and Networks; Optics; Radiant Energy; Measuring.	7-9-76
DESIGNS, GROUP 290—C. D. QUARFORTH, Director. Industrial Arts; Household, Personal and Fine Arts.	3-24-76
MECHANICAL EXAMINING GROUPS	
HANDLING AND TRANSPORTING MEDIA, GROUP 310—D. J. STOCKING, Director. Conveyors; Hoists; Elevators; Article Handling Implements; Store Service; Sheet and Web Feeding; Dispensing; Fluid Sprinkling; Fire Extinguishers; Coin Handling; Check Controlled Apparatus; Classifying and Assorting Solids; Boats; Ships; Aeronautics; Motor and Land Vehicles and Appurtenances; Brakes; Railways and Railway Equipment.	9-1-76
MATERIAL SHAPING, ARTICLE MANUFACTURING, TOOLS, GROUP 320—S. S. MATTHEWS, Director. Manufacturing Processes, Assembling, Combined Machines, Special Article Making; Metal Deforming; Sheet Metal and Wire Working; Metal Fusion—Bonding, Metal Founding; Metallurgical Apparatus; Plastics Working Apparatus; Plastic Block and Earthenware Apparatus; Machine Tools for Shaping or Dividing; Work and Tool Holders, Woodworking; Tools; Cutlery; Jacks.	3-17-77
AMUSEMENT, HUSBANDRY, PERSONAL TREATMENT, INFORMATION, GROUP 330—G. M. FORLENZA, Director. Amusement and Exercising Devices; Projectors; Animal and Plant Husbandry; Butchering; Earth Working and Excavating; Fishing, etc.; Tobacco; Artificial Body Members; Dentistry; Jewelry; Surgery; Toiletry; Printing; Typewriters; Stationery; Information Dissemination.	11-1-76
HEAT, POWER, AND FLUID ENGINEERING, GROUP 340—B. R. GAY, Director. Power Plants; Combustion Engines; Fluid Motors; Reaction Motors; Pumps; Rotary Engines and Pumps; Heat Generation and Exchange; Refrigeration; Ventilation; Drying; Temperature and Humidity Regulation; Machine Elements; Couplings; Gearing; Bearings; Clutches; Power Transmission; Fluid Handling and Control; Lubrication.	11-1-76
GENERAL CONSTRUCTIONS, TEXTILES AND MINING, GROUP 350—M. M. NEWMAN, Director. Joints; Fasteners; Rod, Pipe and Electrical Connectors; Miscellaneous Hardware; Locks; Building Structures; Closure Operators; Bridges; Closures; Earth Engineering; Drilling; Mining; Furniture; Supports; Cabinet Structures; Centrifugal Separations; Coating; Textiles; Apparel and Shoes; Sewing Machines.	2-3-77

Expiration of patents: The patents within the range of numbers indicated below expire during October 1977, except those which may have expired earlier due to shortened terms under the provisions of Public Law 690, 79th Congress, approved August 8, 1946 (60 Stat. 940) and Public Law 619, 83rd Congress, approved August 23, 1954 (68 Stat. 764), or which may have had their terms curtailed by disclaimer under the provisions of 35 U.S.C. 253. Other patents, issued after the dates of the range of numbers indicated below, may have expired before the full term of 17 years for the same reasons, or have lapsed under the provisions of 35 U.S.C. 151.

Patents..... Numbers 2,954,560 to 2,958,080, inclusive
Plant Patents..... Numbers 1,974 to 1,977, inclusive

V 964/5 NO 29 7 7 UMI

REISSUES

NOVEMBER 29, 1977

Matter enclosed in heavy brackets [ ] appears in the original patent but forms no part of this reissue specification; matter printed in italics indicates additions made by reissue.

Re. 29,481
MULTI-WAY DIRECTIONAL FLUID FLOW CONTROL VALVE ARRANGEMENT

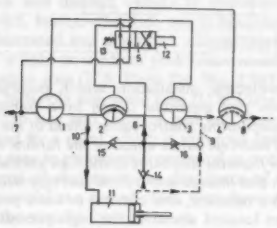
Donald Alexander Larner, Kingston-upon-Thames, England, assignor to Fluid Devices, Ltd.

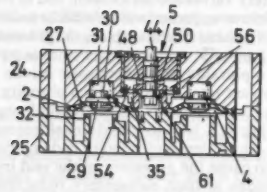
Original No. 3,760,843, dated Sept. 25, 1973, Ser. No. 222,569, Feb. 1, 1972. Application for reissue Jan. 15, 1976, Ser. No. 649,416

Claims priority, application United Kingdom, Feb. 1, 1971, 3646/71

Int. Cl.[2] F15B *13/043*

U.S. Cl. 137—596.15 **18 Claims**





23. A multi-way directional fluid flow control valve assembly for the directional control of a fluid power actuator which comprises:

a first molded housing formed with a pilot valve cavity and with four cavities, each cavity constituting a first diaphragm valve portion, said housing having an end wall defining said diaphragm valve cavity and including a plurality of orifices formed therein, said orifices including a supply orifice, an exhaust orifice and control diaphragm valve orifice in fluid flow communication with said first diaphragm valve portion;

a second molded housing formed with four cavities, each cavity constituting a second diaphragm valve portion, said housing being formed with fluid supply conduit means in fluid communication with two of said second diaphragm valve portions, said housing being formed with fluid exhaust conduit means in fluid communication with the remaining two of said second diaphragm valve portions, said housing being formed with fluid control conduit means in fluid communication with said fluid supply conduit means and said fluid exhaust conduit means;

valve seating means positioned between said first diaphragm valve portion and said second diaphragm valve portion thereby forming a diaphragm valve;

a pressure balanced spool-type valve disposed in said pilot valve cavity of said first molded housing and comprised of a spool of hard metal and a sleeve of hard metal, said spool being formed with a supply conduit means, an exhaust conduit means, and a plurality of conduit means in fluid flow communication with said diaphragm valve control orifices, said conduit means being in alignment with the respective orifices formed in said end wall of said first housing; and

means for mounting said first housing to said second housing.

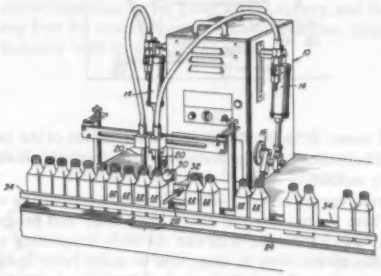
Re. 29,482
CONTAINER FILLING SYSTEM

Sidney Rosen, 4119-27 Fordleigh Road, Baltimore, Md. 21215

Original No. 3,237,661, dated Mar. 1, 1966, Ser. No. 333,026, Dec. 24, 1963. Application for reissue Jan. 21, 1974, Ser. No. 434,884

Int. Cl.[2] B65B *43/42*; B67C *3/00*

U.S. Cl. 141—160 **25 Claims**



1. A system for filling a plurality of containers with fluid, comprising, structure including a pair of spaced movable members defining a filling area, continuously operating means sequentially passing said containers into and out of said filling area, pump means delivering a predetermined amount of said fluid to said containers while within said filling area, first and second means responsive to the operation of said pump means to automatically control the respective movement of each of said movable members, one of said movable members retaining a portion of said containers within said filling area to be filled by said pump means while the other of said movable members separates said portion of said containers from the remainder thereof, said one movable member releasing said portion of said containers when filled and then returning to the retaining position, said other of said movable members releasing said remainder of said containers to permit another portion thereof to pass into said filling area and then returning to the retaining position to separate said another portion of containers from the remaining containers.

Re. 29,483
RECLINING CHAIR

Frank Manuel Ré, Holyoke, Mass., assignor to Dual Manufacturing and Engineering, Incorporated, Holyoke, Mass.

Original No. 3,874,724, dated Apr. 1, 1975, Ser. No. 307,176, Nov. 16, 1972. Division of Ser. No. 222,563, Feb. 1, 1972, Pat. No. 3,758,151, which was reissued as Ser. No. 435,461, Jan. 22, 1974, Pat. No. Re. 28,210. Application for reissue Feb. 28, 1977, Ser. No. 773,054

The portion of the term of this patent subsequent to Oct. 22, 1991, has been disclaimed.

Int. Cl.[2] A47C *1/02*

U.S. Cl. 297—88 **5 Claims**

1. A reclining chair adapted to be positioned in close adjacency to and forwardly of a room wall when in the upright sitting position and yet so structured as to allow ready assumption of a reclined position without physical contact with the same room wall, the reclining chair comprising:

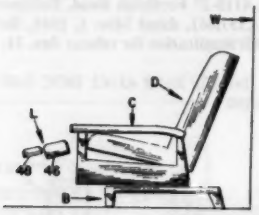
a base, a chassis supported relative to the base,

a body-supporting unit including a seat and a back having a pivotal relationship as to each other,

a leg-supporting unit, mounting means for mounting the body-supporting unit relative to the chassis in movements between upright and reclining positions,

means for mounting the chassis relative to the base in linear movements relative to the base as the body-supporting unit is concomitantly moved,

means for mounting the leg-supporting unit relative to the body-supporting unit in movements between retracted and extended positions as the body-supporting unit is concomitantly moved,



control means for controlling the pivotal motion of the back relative to the seat as the body-supporting unit is concomitantly moved,

and means operatively connecting the body-supporting unit and base for moving the chassis forwardly and progressively away from the wall and the body-supporting unit relative to the wall as transition is made from upright sitting position toward a position of reclination and for moving the chassis rearwardly and progressively toward the wall and the body-supporting unit relative to the wall as transition is made from a position of reclination toward upright sitting position.

Re. 29,484

BARIUM TITANATE BASE CERAMIC COMPOSITION HAVING A HIGH DIELECTRIC CONSTANT

Kazuaki Utsumi; Norio Tsubouchi, and Tomeji Ohno, all of Tokyo, Japan, assignors to Nippon Electric Company, Limited, Tokyo, Japan

Original No. 3,912,527, dated Oct. 14, 1975, Ser. No. 453,998, Mar. 22, 1974. Application for reissue Oct. 4, 1976, Ser. No. 729,290

Claims priority, application Japan, Mar. 24, 1973, 49-33896; May 9, 1973, 48-51996; Feb. 20, 1974, 49-20303; Feb. 22, 1974, 49-21225

Int. Cl.² C04B *35/46;* H01B *1/08*

U.S. Cl. 106—73.32 **8 Claims**

1. A dielectric ceramic composition having a high dielectric constant, consisting of 77.5 to 99.79 mol % of $BaTiO_3$ 0.1 to 10 mol % of at least one of Nb_2O_5 and Ta_2O_5, and about 0.01 to 15 mol % of at least one of the compounds In_2O_3, Ga_2O_3, and Tl_2O_3.

Re. 29,485

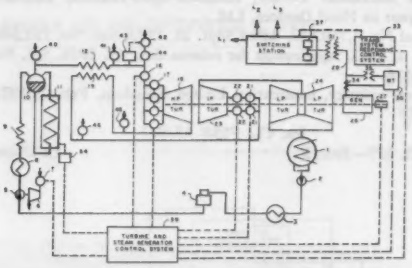
METHOD OF EFFECTING FAST TURBINE VALVING FOR IMPROVEMENT OF POWER SYSTEM STABILITY

Robert H. Park, Main St., Brewster, Mass. 02631

Original No. 3,848,138, dated Nov. 12, 1974, Ser. No. 388,619, Aug. 15, 1973. Continuation-in-part of Ser. No. 244,594, April 17, 1972. Application for reissue Nov. 10, 1975, Ser. No. 630,724

Int. Cl.² F01K *13/02*

U.S. Cl. 290—40 R **17 Claims**



1. In a steam-electric installation which incorporates *an alternating current type generator driven by a compound type steam turbine incorporating control valves ahead of the high pressure turbine, and intercept valves ahead of the turbine or turbines that receive steam from the discharge of the high pressure turbine, which installation also incorporates a fossil fuel type steam generator equipped with* a reheater, *and also one or more* power operated relief valves located ahead of the high pressure turbine, which are so controlled as to open and discharge steam to atmosphere when pressure ahead of the valve or valves exceeds a preset value that is less than that at which the turbine's high pressure safety valves are set to open, and to reclose when pressure falls below a preset value which exceeds normal operating pressure ahead of the turbine, *the generator of* which installation [is part of] *makes connection to* a power system which includes a plurality of prime mover driven generators, which generators are interconnected by a plurality of *alternating current* transmission circuits, the method of employing fast [turbine] valving as a way to avoid development of system instability [as a consequence of stability endangering events of a type adapted to cause the generator of the said installation to experience a sudden at least momentary reduction of load,] which comprises the steps of,

1. providing within the turbine and steam generator control system, for response to a fast valving initiation signal input by bringing into effect preprogrammed jointly effected processes of,
   a. *at least partial* intercept valve closure effected fast enough to have a favorable effect on generator rotor first swing stability, and control valve repositioning plus intercept valve reopening so effected as to cause turbine driving power subsequent to generator rotor first forward swing to hold below a preset value that is less than the driving power that applied prior to the event that brought about development of the signal,
   b. runback of rate of steam production within the steam generator to a value that will cause termination of [the] *whatever* discharge of steam through said power operated relief valves [that will] *may* at first take place, with provision so that said runback is effected rapidly enough *and is otherwise so executed as* to avoid overheating of the reheater,
2. providing in a preprogrammed manner so that [a fast valving signal is generated and transmitted as an input to the turbine and steam generator control system on the occurrence of certain types of events that endanger preservation of system stability.]
   a. a fast valving signal is generated on the occurrence of system stability endangering events of a type that cause the said generator to experience a sudden at least momentary reduction of load,
   b. the said fast valving signal is made available as an input to that portion of the turbine's control system that is adapted to bring into effect the said preprogrammed processes.

PLANT PATENTS

GRANTED NOVEMBER 29, 1977

Illustrations for plant patents are usually in color and therefore it is not practicable to reproduce the drawing.

4,158

MINIATURE ROSE PLANT

Ralph S. Moore, 2519 E. Noble Ave., Visalia, Calif. 93277

Filed Nov. 1, 1976, Ser. No. 737,410
Int. Cl.[2] A01H *5/00*
U.S. Cl. Plt.—9 **1 Claim**

1. A new and distinct variety of miniature rose plant of hardy, dwarf, bushy, rounded, much branched habit, essentially as illustrated and described, characterized by buds and flowers of a light to medium pink color resembling the June Time miniature rose (U.S. Plant Pat. No. 2,563) — and resembling the Cinderella miniature rose (U.S. Plant Pat. No. 1,051 — expired) in size and form of bud and flower; and further characterized by a plant which is vigorous and compact, said plant being easy to propagate from cuttings, with small, disease resistant, semi-glossy leaves, an abundance of bloom, making this variety useful as a potted plant, with flowers borne usually several to the stem in loose clusters.

4,159

APPLE TREE

William E. Silvers, Zillah, Wash., assignor to Claud Callahan and Marjorie McCormick, both of Yakima, Wash.

Filed Nov. 15, 1976, Ser. No. 742,529
Int. Cl.[2] A01H *5/03*
U.S. Cl. Plt.—35 **1 Claim**

1. A new and distinct variety of Apple tree, substantially as herein shown and described, characterized particularly as to novelty by the unique combination of a more dwarf tree with many fruit spurs and larger, deeper green color, heavier and tougher leaves than the variety "Hi Early Delicious", bright cherry red striped early color with exceptionally long fruit, the date of maturity and ability to harvest two weeks ahead of the Hi Early parent variety, the coloring beginning with red striping finishing into solid red 3 weeks ahead of its recommended harvest season, very juicy extra firm fruit with greater sugar test percentage than the Hi Early parent variety, and the ability to keep fruit for much longer periods of time than other varieties, together with its disease resistance.

4,160

MINIATURE ROSE PLANT

Ralph S. Moore, 2519 E. Noble Ave., Visalia, Calif. 93277

Filed Jan. 24, 1977, Ser. No. 762,029
Int. Cl.[2] A01H *5/00*
U.S. Cl. Plt.—9 **1 Claim**

1. A new and distinct variety of miniature rose plant of hardy, dwarf, bushy, upright, much branched habit, essentially as illustrated and described, characterized by buds and flowers of a coral pink to light red color resembling the Persian Princess miniature rose (U.S. Plant Pat. No. 3,181) but often being somewhat more pink in the bud and opening stages, then becoming more red in the maturing and final stages (especially when grown outdoors), the form and size of bud and flower also being similar to Persian Princess; and further characterized by a plant which is vigorous and relatively compact, said plant being easy to propagate from cuttings, with small, disease resistant, glossy foliage, an abundance of bloom with excellent keeping quality, with flowers borne singly or several to the stem in loose clusters.

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PATENTS

GRANTED NOVEMBER 29, 1977

ERRATA

For CLASS	See PATENT NO.
029–403	4,059,896
029–432.1	4,059,897
029–598	4,059,898
280–106 T	4,060,145
366–179	4,060,223
366–169	4,060,224
366–040	4,060,225
366–075	4,060,226
062–162	4,060,400
252–008.8	4,060,505
560–208	4,060,545
428–195	4,060,643
424–329	4,060,652
560–222	4,060,681
219–219	4,060,712
364–416	4,060,713
364–431	4,060,714
364–557	4,060,715
364–576	4,060,716
364–497	4,060,717
364–421	4,060,718
364–729	4,060,719
235–309	4,060,720
362–013	4,060,721
362–032	4,060,722
362–205	4,060,723
362–032	4,060,724
363–057	4,060,757
364–900	4,060,794
364–900	4,060,795
365–183	4,060,796
365–025	4,060,798
346–001	4,060,804

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PATENTS

GRANTED NOVEMBER 29, 1977

GENERAL AND MECHANICAL

4,059,852

INFLATABLE SUIT FOR CYCLISTS

Stanley J. Crane, 1771 N. Vermont Ave., Los Angeles, Calif. 90027

Filed May 24, 1976, Ser. No. 689,244
Int. Cl.[2] B60R *21/00*; A41D *13/00*
U.S. Cl. 2—2 **5 Claims**

1. A protective garment for minimizing impact-caused injury to the body of a vehicle rider, the combination of:

a. a suit adapted to be worn by said vehicle rider including an inflatable means which, when inflated will provide impact protection to the vehicle rider;

b. inlet means for introducing gas into said inflatable means;

c. a source of gas under pressure connected to said inlet means;

d. detachable means connected to said source of gas under pressure and to said vehicle, said detachable means including means for permitting separation of said source of gas from said vehicle upon movement of said vehicle rider relative to said vehicle, said source of gas under pressure remaining connected to said inlet means after separation of said source of gas from said vehicle has occurred; and

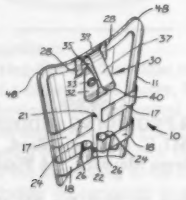
e. means whereby said valve is opened by said detachable means.

4,059,853

TIE CLASP

George W. Girdler, Fort Lauderdale, Fla., assignor to Jack Steinberg, Hialeah, Fla., a part interest

Continuation-in-part of Ser. No. 666,962, March 16, 1976, Pat. No. 4,024,585, which is a continuation-in-part of Ser. No. 613,172, Sept. 15, 1975, Pat. No. 3,958,277. This application Jan. 12, 1977, Ser. No. 758,717
Int. Cl.[2] A41D *25/08*
U.S. Cl. 2—152 A **9 Claims**



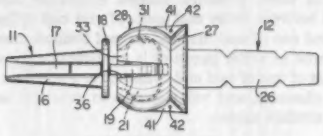
1. A tie clasp for supporting neckwear comprising a plate adapted to be positioned on the front of a shirt collar; hook means mounted on the back of said plate for suspending said plate from the shirt collar; and neckwear receiving means positioned on the back of said plate below said hook means with said neckwear receiving means including upper and lower generally parallel bars each segmented to define a central slot through which neckwear may be passed in suspending the neck wear from the receiving means bars with the neckwear ends draped in mutually lateral or overlaid positions, respectively, and wherein at least one of said bars has a pair of inwardly directed neckwear retaining tabs straddling said one bar central slot; and wherein said neckwear retaining tabs are generally cylindrical thereby presenting convex surfaces facing said one bar central slot over which neckwear may be smoothly passed through the slot.

4,059,854

RIBBED FINGER JOINT IMPLANT

George R. Laure, Kalamazoo, Mich., assignor to Laure Prosthetics, Inc., Portage, Mich.

Filed Jan. 3, 1977, Ser. No. 756,240
Int. Cl.[2] A61F *1/24*
U.S. Cl. 3—1.91 **2 Claims**



1. In an implantable-type endoprosthesis for a digital joint, the endoprosthesis including a protuberant headed member provided with a stem portion at one end thereof for affixing said member in a bone and a protuberant head portion at the other end thereof, and a socketed member provided with a stem portion at one end thereof for fixing said member in a bone and a socket portion at the other end thereof which defines an interior socket cavity in which the protuberant head portion is removably retained and swingably supported, said socket portion including a socket part having a generally spheroid external configuration, said socket portion also including an annular guard flange fixedly connected to the rearward side of said socket part so as to be interposed between said socket part and the respective stem portion, said guard flange and said socket part having opposed external surfaces which diverge away from one another, comprising the improvement wherein said socket portion has means fixedly associated therewith and disposed exteriorly thereof for permitting the ligaments, muscles or tendons to be fixedly tied thereto, said means defining a pair of ribs which are integral with said socket portion and extend between the diverging external surfaces of said socket part and said guard flange, said ribs extending in a direction approximately parallel to the elongated direction of the respective stem portion and being disposed in wide circumferentially spaced relationship with respect to the socket part so as to be positioned on opposite sides of the joint when implanted in a digit, said ribs having opening means extending therethrough for permitting suturing of the tendons, ligaments or muscles thereto, and said ribs being dimensioned so as to not project outwardly beyond the outer dimensional limits defined by either said guard flange or said socket part so as to not interfere with the implanting of the joint in a digit.

4,059,855

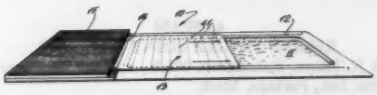
RETRACTABLE COVER FOR GROUND OPENING

Carmel Riendeau, 25, boul. des Haut-Bois, Ste-Julie, Quebec, Canada

Filed Nov. 8, 1976, Ser. No. 739,970
Int. Cl.[2] E04H *3/16, 3/18*; F16L *22/02*
U.S. Cl. 4—172.14 **17 Claims**

1. A retractable cover mechanism for covering an open area, said mechanism comprising a pair of parallel channels secured on a respective opposed side of an open area to be covered, a

plurality of displaceable intermediate cylinders in each of said channels between displaceable end cylinders, said intermediate cylinders and said end cylinder at a first common end of both said channels being water conducting, said end cylinders at a second common end of both said channels having solid end walls which are non-water conducting, first extensible conduit means secured between facing ends of adjacent ones of said intermediate and end cylinders, attachment means secured to at least some of said cylinders and to a cover sheet to displace-



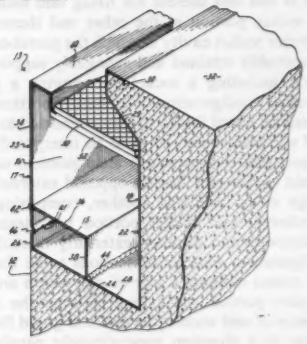
ably support said cover sheet between said pair of parallel channels, first and second conduit means connectable to a source of water pressure, second extensible conduit means secured between outer end walls of said end cylinders and an associated one of said first and second conduit means whereby said source of water pressure is applicable against said outer end walls of one of said end cylinders at a common end of each of said channels, and valve means to evacuate said first and second conduit means.

4,059,856

SWIMMING POOL GUTTER

James A. Patterson, P.O. Box 2894, Columbus, Ohio 43204

Filed June 1, 1976, Ser. No. 691,446
Int. Cl.[2] E04H *3/16, 3/18;* F16L *22/02*
U.S. Cl. 4—172.17 9 Claims



1. A gutter for swimming pool comprising, in combination,

a first sheet metal member including a vertical back wall, a horizontal bottom wall, a vertical inside wall; and

a second sheet metal member including a vertical wall in spaced relation to said back wall and a horizontal wall spaced substantially below the top of said vertical wall of said second member defining with said first member a gutter conduit, over the top of said vertical wall of said second member water may flow from the pool into said gutter conduit;

said vertical wall of said second member being joined to said vertical inside wall of said first member by a continuous, longitudinal weld exposed at the pool side thereof to form the inside wall of said gutter;

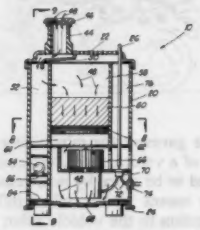
said horizontal wall of said second member being joined to said first member by a second continuous, longitudinal weld exposed at the gutter conduit side thereof to form at the bottom of said gutter conduit substantially below the top of said vertical wall of said second member a sealed inlet conduit adapted to receive filtered water under pressure for introduction into the pool, said vertical inside wall of said first member forming the inside wall of said inlet conduit.

4,059,857

FREE STANDING TOILET STOOL VENTILATING DEVICE

Clarence E. Poister, 2934 Lydia, Apt. 103, Topeka, Kans. 66614

Filed Dec. 20, 1976, Ser. No. 752,470
Int. Cl.[2] A47K *3/22;* E03D *9/04, 13/00*
U.S. Cl. 4—213 9 Claims



1. A free standing toilet stool ventilating device for placing adjacent a toilet and ventilating fumes therefrom, the device comprising:

a housing having an air intake port disposed in the top thereof and an air discharge port disposed in the bottom thereof;

a hollow air inlet arm having one end disposable between the top of the toilet bowl and the bottom of the toilet seat, the other end of said air inlet arm pivotally attached to the air intake port of said housing;

an electric blower mounted in said housing for drawing air from the air intake port and discharging it through the air discharge port;

a filter mounted in said housing and positioned above the blower for filtering the intake air; and

water overflow means mounted in said housing for receiving an overflow of water from the toilet through the air intake port and discharging the water out a water discharge port, thereby preventing the water from contacting said filter and said electric blower.

4,059,858

DRAIN CLEANER PROVIDING SUDDEN BLAST OF GAS

Reinhold Lambel, 517 E. Algonquin Road, Arlington Heights, Ill. 60005, and Steven Maynard, 716 Webley Court, Schaumburg, Ill. 60671

Filed Nov. 26, 1975, Ser. No. 635,344
Int. Cl.[2] B08B *9/02, 5/00*
U.S. Cl. 4—255 2 Claims

1. Apparatus for clearing clogged drains including a sealing ring for sealing around the drain opening, a pressure chamber arranged for delivering through said seal ring and opening a sudden burst of fluid under gas pressure; a rupturable diaphragm initially sealing the pressure chamber from said ring but constructed to open suddenly for copious flow in response to a high pressure in the pressure chamber, and means for supplying gas under pressure to the pressure chamber to raise the pressure therein until said high pressure is reached;

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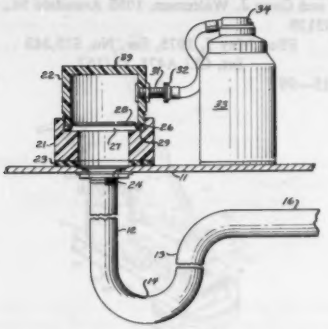
in which the diaphragm is constructed with a scoredemarked tongue, the scoring leaving a web which retains



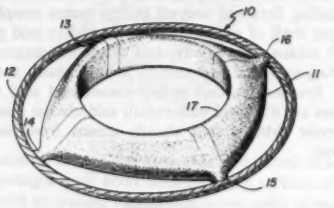
connection of the tongue to the diaphragm when rupture separates other tongue edges.

4,059,859

LIFE RING

Evan B. Hull, 49 Pleasant St., Northboro, Mass. 01532

Filed May 21, 1976, Ser. No. 688,737
Int. Cl.[2] B63C 9/08
U.S. Cl. 9—340 6 Claims



1. Life ring, comprising:

a. main body of ring-like configuration with a cross-section in the shape of a closed plane figure, formed of flotation material, and having a circular central aperture, the outer periphery of the main body being in the shape of a multi-sided figure having corners in which the sides are of equal length, each of the sides being in the form of the arc of a circle whose radius of curvature is substantially larger than the radius of the aperture, the cross-sectional shape of the main body being generally triangular with rounded corners, one side defining a bottom plane surface, a second side defining a central aperture in the main body, the said bottom plane surface being perpendicular to the axis of the central aperture,

b. a circular rigid secondary ring located externally of the main body and generally in the said bottom plane surface, and

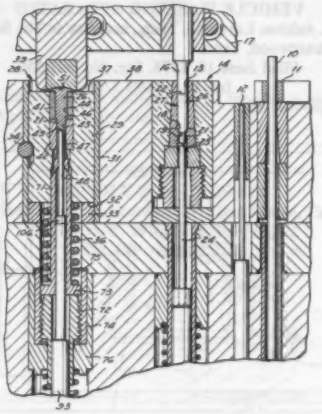
c. means joining the outer periphery of the main body to the secondary ring at the said corners.

4,059,860

APPARATUS FOR MAKING SHOULDERED TUBULAR RIVETS

Paul A. Fick, Fremont, Ohio, assignor to The National Machinery Company, Tiffin, Ohio

Division of Ser. No. 519,925, Nov. 1, 1974, Pat. No. 3,978,538. This application June 11, 1976, Ser. No. 695,089
Int. Cl.[2] B21K 1/60
U.S. Cl. 10—11 R 3 Claims



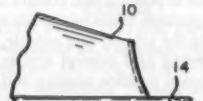
1. An apparatus for forming shouldered tubular rivets comprising cooperating first tool and die means operable in a first operation to trap extrude a blank to form an extruded inner end portion of reduced diameter and to square the outer end of the blank, said cooperating first tool and die means being structured to accommodate variations in the volume of the blank at the inner end thereof, cooperating second tool and die means operable in a second operation to square said inner end of said blank and confine a predetermined volume extending from said inner end thereof required to form all but the head of the rivet and to upset a head from the unconfined portion, variations in the volume of said blank appearing as variations in the head of said rivet, and third cooperating tool and die means operable in a third operation to forward extrude a tubular skirt on the inner end of said blank.

4,059,861

WET LATEX LASTING SYSTEM

John J. Santos, Jr., N. Attleboro, and Joseph V. Tassone, Milford, both of Mass., assignors to Compo Industries, Inc., Waltham, Mass.

Filed June 1, 1976, Ser. No. 691,548
Int. Cl.[2] A43D 21/00
U.S. Cl. 12—145 4 Claims



1. The method of lasting a cover strip to the insole at the bottom of a shoe upper provided with a sock lining turned down at the edge of the insole and stitched to the lower edge of the upper and the upper folded edge of the cover strip, and wherein said insole is fiberboard material, comprising lasting the unattached portion of the cover strip about the edge of the

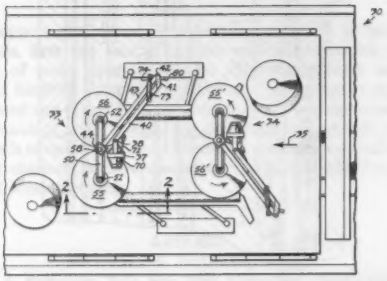
insole onto the bottom with latex applied to the cover strip in a uniformly thick, partially coagulated adhesive condition, characterized in that a uniformly thick prime coating of compatible rubber adhesive dissolved in a hydrocarbon solvent is applied to the marginal edge of the insole and allowed to dry prior to lasting the cover strip thereto.

4,059,862

DOUBLE WRAPAROUND BRUSH ASSEMBLY FOR VEHICLE WASHING APPARATUS

Shirley B. Ashton, Lavergne, Tenn., assignor to The Smith Company, Brentwood, Tenn.

Filed June 18, 1976, Ser. No. 697,536
Int. Cl.² B60S *3/06*
U.S. Cl. 15—53 AB **3 Claims**



1. In a vehical washing apparatus including a frame having a longitudinal axis coinciding with the path of movement of the vehicle through the apparatus, a double wraparound brush assembly comprising:

a. a control arm having first and second ends,

b. mounting means pivotally supporting said first end upon said frame for pivotal movement of said control arm about a first vertical axis,

c. a brush arm having first and second ends,

d. means connecting the first end of said brush arm to the second end of said control arm for relative, pivotal movement about a second vertical axis,

e. a brush beam having opposite ends,

f. means journalling the middle portion of said brush beam to the second end of said brush arm for free rotary movement about a third vertical axis,

g. rotary brush means journaled at each end of said brush beam for rotary movement about vertical brush axes,

h. means for driving said brush means,

i. biasing means constantly urging said brush arm toward said control arm, said biasing means yielding to the pressure exerted between the vehicle moving along said path against said brush means to force said brush means to move from the front of said vehicle along the side of said vehicle,

j. positioning means to position said control arm at a substantially outboard position while said brush means is in front of, and engaging the side of, said vehicle,

k. means for swinging said control arm to a substantially longitudinal inboard position causing said brush means to swing across the rear surface of said vehicle as the vehicle moves forward along said path, and

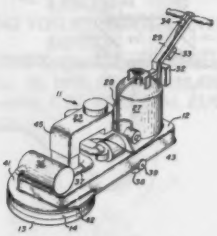
l. a rotary position sensor adapted to be actuated by the change in rotary movement between said brush beam and said brush arm as said brush means moves from the front of the vehicle, moving forward along said path, to a position engaging the side of said forward-moving vehicle, said rotary position sensor being operatively connected to said means for swinging said control arm, so that actuation of said sensor causes said control arm to swing toward its inboard longitudinal position.

4,059,863

COMBUSTION ENGINE POWERED FLOOR BUFFER

Robert C. Deuchar, 3401 Hoover St., Redwood City, Calif. 94063, and Gene J. Waitzman, 1055 Avondale St., San Jose, Calif. 95129

Filed May 7, 1975, Ser. No. 575,343
Int. Cl.² A47L *11/162*
U.S. Cl. 15—98 **10 Claims**



1. In a combustion engine powered floor buffer:

floor buffer chassis means for supportively receiving the operative elements of the floor buffer;

buffer pad driver means for rotationally driving a buffer pad to be coupled thereto, said buffer pad driver means being rotationally coupled to said floor buffer chassis means;

an air cooled internal combustion engine means for supplying the rotational driving power to said buffer pad driver means;

means for coupling said combustion engine means in heat exchanging relation with said chassis means for heat sinking said engine so as to provide substantial thermal conduction cooling of said combustion engine means to said chassis means and thence to the surrounds of said chassis means, in use; and

wherein said buffer pad driver means includes, pad driver shaft means rotationally carried from said chassis means, power transmission means for transmitting the rotational output power derived from the output shaft of said engine means to the buffer pad, said power transmission means including first and second pulley means coupled to the output shaft of said engine means and to said pad driver shaft means respectively, and drive belt means interconnecting said first and second pulley means, and wherein said first and second pulley means and said drive belt means are disposed underneath said chassis means on the opposite side of said chassis means from said engine means.

4,059,864

OVEN CLEANING IMPLEMENT

Sharon Spresny, 3197 Arnold Court, Bay City, Mich. 48706

Filed Aug. 24, 1976, Ser. No. 717,119
Int. Cl.² A47L *13/08*
U.S. Cl. 15—105 **4 Claims**

1. An oven cleaning implement comprising:

An elongated tubular handle having an upper and lower telescoping portion, means on said handle for locking said upper and lower telescoping portions together in adjusted relation, said locking means including a plurality of resilient split fingers on a terminal end of said upper telescoping portion of said handle having configuous threads about their outer circumference, and a nut threadedly received on said fingers,

an elongated base,

means rotatably mounting the lower telescoping portion of said handle on said base,

means between said base and lower telescoping portion of said handle for clamping said handle to said base.

said rotatable mounting means and clamping means including a pair of integrally formed upright plates on said base,

an integrally formed flat on the lower terminal end of said lower telescoping portion of said handle received between said upright plates, a bolt having a threaded end received

through said upright plates and flat, and a nut threadedly connected to the threaded end of said bolt, and a sponge removably mounted on said base.

4,059,865

SHOE CLEANING MAT

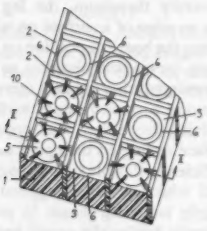
Achim D. Schmidt, Hohenlockstedt, Holstein, Germany, assignor to Alveru S. A., Fribourg, Switzerland

Filed June 30, 1976, Ser. No. 701,023

Claims priority, application Germany, July 2, 1975, 7520999[U]

Int. Cl.[2] A46B *7/04;* A47L *23/26*

U.S. Cl. 15—161 14 Claims



1. A device for cleaning of shoe gear in the form of a traversible mat having a basic body with an upper surface of suitable solid material providing recesses between webs arranged in a grate form, comprising: annular, removable brush bodies held in the recesses, and stiff, resilient bristles fixed in and projecting from the bodies over the webs, said bristles being arranged as rings around the peripheries of said brush bodies to project outwardly at an incline to the vertical from the upper surface of said brush body and over the webs of said basic body of the mat.

4,059,866

SWAGEABLE SLEEVE

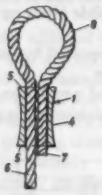
Bernhard Rohland, Molndal, Sweden, assignor to Firma Bernex, Molndal, Sweden

Continuation of Ser. No. 547,034, Feb. 4, 1975, abandoned. This application June 1, 1976, Ser. No. 691,782

Int. Cl.[2] F16L *11/10*

U.S. Cl. 16—108 3 Claims

1. In a rope clamp comprising a sleeve of plastic malleable material arranged to be firmly pressed around one or more rope parts, the improvement wherein the sleeve is provided with an axial center hole having substantially the same cross-section over the entire sleeve length and with a wall thickness



which is thinnest at the mid-portion of the sleeve and thickest at the end portions of the sleeve.

4,059,867

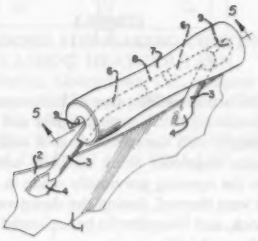
HANDLE FOR UTENSILS

Robert J. Adamis, 3425 Monterey St., San Mateo, Calif. 94403

Filed Sept. 1, 1976, Ser. No. 719,372

Int. Cl.[2] A47B *95/02*

U.S. Cl. 16—110 A 1 Claim



1. In combination,
a pan,
a rim on said pan,
a handle grip having an axial passage therethrough and having an outer periphery defined by a cylindrical portion at each end joined by a concave intermediate portion,
a radial pocket at each end of the passage extending toward said pan through said cylindrical portions,
a rigid connecting bar at each end of the handle grip,
a bent end of each bar extending from said pocket axially into said passage and a radial portion of the bar being restrained in said pocket axially inwardly of the end of said handle for preventing rotation of said handle grip and exposure of the bent ends,
the other end of each bar being flattened in a plane containing said radial portions and welded to said pan adjacent said rim.

4,059,868

APPARATUS FOR CUTTING OPEN A FOWL

Pieter Meyn, Noordeinde 68, Oostzaan, Netherlands

Filed Oct. 18, 1976, Ser. No. 733,362

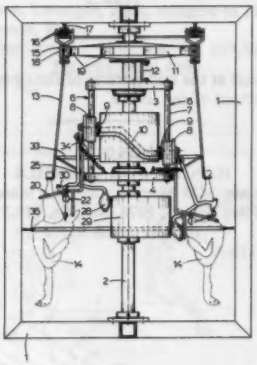
Claims priority, application Netherlands, Nov. 25, 1975, 7513767

Int. Cl.[2] A22C *21/00*

U.S. Cl. 17—11 15 Claims

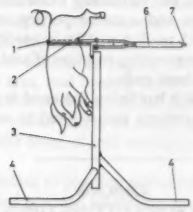
1. An apparatus for cutting open the body cavity of a fowl, which is hanging by the ankle joints from a hook of an overhead conveyor and the vent of which has been cut out, comprising
a frame;
at least one guide means movable connected to said frame;
means for moving said guide means along with the conveyor;

a slide block reciprocatably mounted on said guide means;
means allowing said slide block to move down along said guide means towards a fowl carried by said conveyor, and for moving said slide block up and away from said fowl; and
a cutting means supported by said slide block; said cutting means comprising
a generally rounded protrusion formed by two laterally separatable complementary segments,



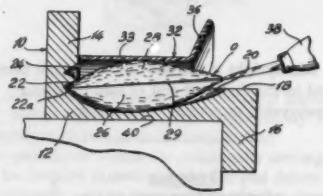
a knife attached to at least one of said segments, and
means for moving said segments apart and together in synchronisation with the movements of said slide block;
said protrusion segments being adapted when closed to be inserted into the opening previously made in the fowl by cutting out the vent thereof, during the downward movement of said slide block, and thereafter to be separated so that said fowl is cut open by said knife.

4,059,869
ANIMAL HOLDER
Mathias Dunstheimer, No. 48, Holzheim, Germany (8851)
Filed Sept. 26, 1975, Ser. No. 617,138
Claims priority, application Germany, Sept. 27, 1974, 2446370
Int. Cl.² A22B *1/00*
U.S. Cl. 17—44 **2 Claims**



1. A holding apparatus for hanging animals with their heads in the downward direction, said apparatus comprising:
a stand;
a first and second clamp means for embracing an animal immediately before its hind legs, said second clamp means being fixedly attached to said stand and said first clamp means being also connected to said stand and rotable about a vertical axis;
a disc means connected to said first clamp means, said disc means including a plurality of notches on the periphery thereof;
a rotatable lever means associated with said disc means for moving said first clamp means relative to said second clamp means, said lever means being adapted to engage at least one of the notches on the periphery of said disc; and,
a locking means for locking said first clamp means, relative to said second clamp means, whereby the first clamp means with respect to the second clamp means can be adjusted in finite discrete steps through the use of said lever means.

4,059,870
OYSTER BOARD
Morris Finkelman, Montreal, Canada, assignor to Amcar Industries, Ltd., Canada
Filed Aug. 30, 1976, Ser. No. 718,819
Int. Cl.² A22C *29/04*
U.S. Cl. 17—75 **2 Claims**



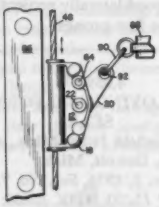
1. An improved oyster board comprising a base, a rear wall extending upwardly from the base, a receiving depression in an upper surface of said base, the depression being situated in the base adjacent at least one longitudinal groove in the rear wall, the at least one groove being situated adjacent the upper surface of the base and adapted to receive an edge portion of any oyster or clam shell therein, the base having a leg portion extending downwardly therefrom, the leg portion portion adapted to engage an edge of a surface on which the board is placed so as to retain the board in position on the surface when in use, a flexible grip for manually holding an oyster or clam in the receiving depression during opening thereof with an oyster knife, the grip having a curved upper surface spanning the width of the receiving depression, with opposite edges of the curved upper surface resting on the upper surface of the base, the grip being sufficiently flexible so as to engage an upper part of the oyster shell when pressure is applied to the grip with one's hand, the grip including means to protect one's hand from being accidently cut by the oyster knife when opening the oyster or clam, the means on the grip to protect one's hand comprises a flange extending upwardly and forwardly along a front edge of the upper surface of the grip, the height of the flange being sufficient to protect one's hand placed on the curved upper surface of the grip, the oyster board including two spaced-apart longitudinal V-shaped grooves extending approximately the length of the receiving depression in the rear wall of the oyster board, a lower longitudinal groove adapted to receive an edge portion of a smaller oyster, while the upper longitudinal groove is adapted to receive the edge portion of the shell of a larger oyster positioned within the receiving depression, the receiving depression being concave in configuration and is substantially oval in plan view, with a longer dimension of the oval configuration extending along the length of the upper surface of the base to receive an oyster positioned lengthwise of the base in the receiving depression, the receiving depression also including a forwardly extending bulge from the oval configuration to permit the placing of oysters or clams in the receiving depression placed widthwise of the base, the oyster receiving depression being of a depth such that a juncture between the upper and lower shells of the oyster is situated above the upper surface of the oyster board, thereby providing access to the juncture of the shells by means of the oyster knife.

4,059,871

CLAMPING DEVICE WITH LOCKING TRIGGER ARM

William E. Swager, P.O. Box 656, Fremont, Ind. 46737

Filed Sept. 17, 1976, Ser. No. 724,262
Int. Cl.[2] F16G *11/10*
U.S. Cl. 24—134 R 7 Claims



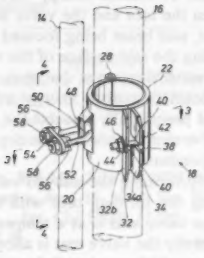
1. In a safety clamp, a housing for slidably mounting about an elongated body of the character of a rope, cable, bar, pipe or the like, and a clamping means for gripping said elongated body in clamped engagement thereon, said clamping means comprising a pivotally supported lever having one end extending outward thereof as a trigger arm for fastening to the body of the climber, whereby the safety device may be drawn slidingly upon said elongated body as the climber ascends or descends a ladder or the like near said elongated body, the inner end of said clamping means being shaped as a cam and adapted to grip said elongated body, firmly clamping thereagainst, and resilient means biasing sid cam and trigger arm into clamping engagement with said elongated body on its pivotal support, and latching means engaging said trigger arm in unclamped position, securing said trigger arm and cam out of clamping engagement with said elongated body to allow free sliding thereon in climbing movement of said climber.

4,059,872

HOSE CLAMP ASSEMBLY

Domenico Delesandri, P. O. Box 428, League City, Tex. 77573

Filed Nov. 24, 1975, Ser. No. 634,540
Int. Cl.[2] F16L *3/08*; B65D *63/00*
U.S. Cl. 24—284 5 Claims



1. In combination with an elongate, constictable, relatively slack hose, and an elongate, substantially incompressible, relatively taut cable disposed generally laterally adjacent and parallel thereto, a clasp assembly for gripping said hose and securing said hose to said cable for stabilizing said hose underwater, said clasp assembly comprising:

a. mating first and second gripping components with a pivotable connection to each other, said components having respective opposed longitudinally extending edges distal said pivotable connection, and movable about said connection to encircle said hose for frictional, substantially non-constricting gripping engagement between said clasp assembly and said hose;

b. locking means on said gripping components for locking said components together, said locking means including:

i. a bolt section pivotally secured to said first gripping component adjacent its edge and having a threaded movable end;

ii. a nut member threaded to said movable end of said bolt section;

iii. a plate member rigidly adjoined to and extending generally radially from said second gripping component adjacent its edge, said plate member having a generally radially opening slit therein for receipt of said bolt section, and an outer side surface flared away from said edge of said second gripping component from its radially innermost to its radially outermost extremity whereby said nut member may engage said outer side surface, when said bolt section is received in said slit, at an angle to lock said components together; and

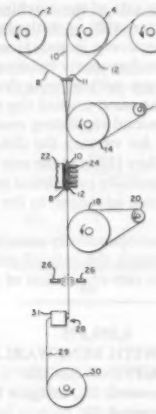
c. clamp means connected to the exterior of one of said components for gripping said cable.

4,059,873

FLUID PROCESS FOR MAKING CONTINUOUS FILAMENT HEATHER YARN

Thomas Larson Nelson, Georgetown, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Division of Ser. No. 609,010, Aug. 29, 1975, abandoned. This application Nov. 2, 1976, Ser. No. 738,168
Int. Cl.[2] D02G *1/16*; D02J *1/08*
U.S. Cl. 28—271 10 Claims



1. A process for making a continuous filament heather yarn, comprising

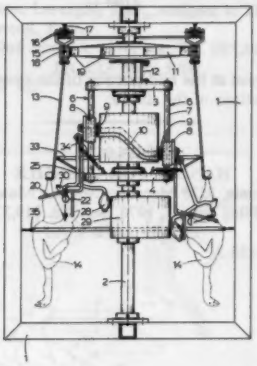
a. subjecting a plurality of crimped continuous filament yarns of different color and/or dye receptivity and having a total denier of at least 400 to a tension of from 0.5 to 1.25 grams per denier to straighten the crimp of the filaments within each of said yarns and to disentangle and parallelize the filaments,

b. feeding said yarns under tension and in contiguous relationship into a jet intermingling zone,

c. randomly jet intermingling the filaments of said yarns from yarn-to-yarn, and

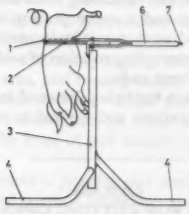
d. withdrawing the intermingled yarn from said zone at a rate which is 4 to 30% less than the feed rate of the yarns to said zone.

a slide block reciprocatably mounted on said guide means;
means allowing said slide block to move down along said guide means towards a fowl carried by said conveyor, and for moving said slide block up and away from said fowl; and
a cutting means supported by said slide block; said cutting means comprising
a generally rounded protrusion formed by two laterally separatable complementary segments,



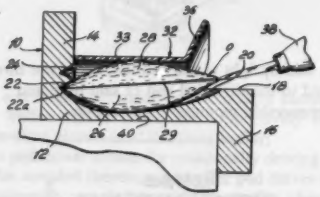
a knife attached to at least one of said segments, and
means for moving said segments apart and together in synchronisation with the movements of said slide block;
said protrusion segments being adapted when closed to be inserted into the opening previously made in the fowl by cutting out the vent thereof, during the downward movement of said slide block, and thereafter to be separated so that said fowl is cut open by said knife.

4,059,869
ANIMAL HOLDER
Mathias Dunstheimer, No. 48, Holzheim, Germany (8851)
Filed Sept. 26, 1975, Ser. No. 617,138
Claims priority, application Germany, Sept. 27, 1974, 2446370
Int. Cl.² A22B *1/00*
U.S. Cl. 17—44 **2 Claims**



1. A holding apparatus for hanging animals with their heads in the downward direction, said apparatus comprising:
a stand;
a first and second clamp means for embracing an animal immediately before its hind legs, said second clamp means being fixedly attached to said stand and said first clamp means being also connected to said stand and rotable about a vertical axis;
a disc means connected to said first clamp means, said disc means including a plurality of notches on the periphery thereof;
a rotatable lever means associated with said disc means for moving said first clamp means relative to said second clamp means, said lever means being adapted to engage at least one of the notches on the periphery of said disc; and,
a locking means for locking said first clamp means, relative to said second clamp means, whereby the first clamp means with respect to the second clamp means can be adjusted in finite discrete steps through the use of said lever means.

4,059,870
OYSTER BOARD
Morris Finkelman, Montreal, Canada, assignor to Amcar Industries, Ltd., Canada
Filed Aug. 30, 1976, Ser. No. 718,819
Int. Cl.² A22C *29/04*
U.S. Cl. 17—75 **2 Claims**



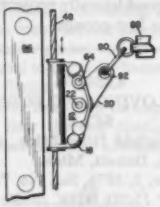
1. An improved oyster board comprising a base, a rear wall extending upwardly from the base, a receiving depression in an upper surface of said base, the depression being situated in the base adjacent at least one longitudinal groove in the rear wall, the at least one groove being situated adjacent the upper surface of the base and adapted to receive an edge portion of any oyster or clam shell therein, the base having a leg portion extending downwardly therefrom, the leg portion portion adapted to engage an edge of a surface on which the board is placed so as to retain the board in position on the surface when in use, a flexible grip for manually holding an oyster or clam in the receiving depression during opening thereof with an oyster knife, the grip having a curved upper surface spanning the width of the receiving depression, with opposite edges of the curved upper surface resting on the upper surface of the base, the grip being sufficiently flexible so as to engage an upper part of the oyster shell when pressure is applied to the grip with one's hand, the grip including means to protect one's hand from being accidently cut by the oyster knife when opening the oyster or clam, the means on the grip to protect one's hand comprises a flange extending upwardly and forwardly along a front edge of the upper surface of the grip, the height of the flange being sufficient to protect one's hand placed on the curved upper surface of the grip, the oyster board including two spaced-apart longitudinal V-shaped grooves extending approximately the length of the receiving depression in the rear wall of the oyster board, a lower longitudinal groove adapted to receive an edge portion of a smaller oyster, while the upper longitudinal groove is adapted to receive the edge portion of the shell of a larger oyster positioned within the receiving depression, the receiving depression being concave in configuration and is substantially oval in plan view, with a longer dimension of the oval configuration extending along the length of the upper surface of the base to receive an oyster positioned lengthwise of the base in the receiving depression, the receiving depression also including a forwardly extending bulge from the oval configuration to permit the placing of oysters or clams in the receiving depression placed widthwise of the base, the oyster receiving depression being of a depth such that a juncture between the upper and lower shells of the oyster is situated above the upper surface of the oyster board, thereby providing access to the juncture of the shells by means of the oyster knife.

4,059,871

CLAMPING DEVICE WITH LOCKING TRIGGER ARM

William E. Swager, P.O. Box 656, Fremont, Ind. 46737

Filed Sept. 17, 1976, Ser. No. 724,262
Int. Cl.[2] F16G *11/10*
U.S. Cl. 24—134 R 7 Claims



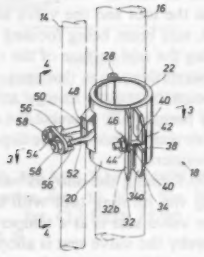
1. In a safety clamp, a housing for slidably mounting about an elongated body of the character of a rope, cable, bar, pipe or the like, and a clamping means for gripping said elongated body in clamped engagement thereon, said clamping means comprising a pivotally supported lever having one end extending outward thereof as a trigger arm for fastening to the body of the climber, whereby the safety device may be drawn slidingly upon said elongated body as the climber ascends or descends a ladder or the like near said elongated body, the inner end of said clamping means being shaped as a cam and adapted to grip said elongated body, firmly clamping thereagainst, and resilient means biasing sid cam and trigger arm into clamping engagement with said elongated body on its pivotal support, and latching means engaging said trigger arm in unclamped position, securing said trigger arm and cam out of clamping engagement with said elongated body to allow free sliding thereon in climbing movement of said climber.

4,059,872

HOSE CLAMP ASSEMBLY

Domenico Delesandri, P. O. Box 428, League City, Tex. 77573

Filed Nov. 24, 1975, Ser. No. 634,540
Int. Cl.[2] F16L *3/08*; B65D *63/00*
U.S. Cl. 24—284 5 Claims



1. In combination with an elongate, constictable, relatively slack hose, and an elongate, substantially incompressible, relatively taut cable disposed generally laterally adjacent and parallel thereto, a clasp assembly for gripping said hose and securing said hose to said cable for stabilizing said hose underwater, said clasp assembly comprising:

a. mating first and second gripping components with a pivotable connection to each other, said components having respective opposed longitudinally extending edges distal said pivotable connection, and movable about said connection to encircle said hose for frictional, substantially non-constricting gripping engagement between said clasp assembly and said hose;

b. locking means on said gripping components for locking said components together, said locking means including:

i. a bolt section pivotally secured to said first gripping component adjacent its edge and having a threaded movable end;

ii. a nut member threaded to said movable end of said bolt section;

iii. a plate member rigidly adjoined to and extending generally radially from said second gripping component adjacent its edge, said plate member having a generally radially opening slit therein for receipt of said bolt section, and an outer side surface flared away from said edge of said second gripping component from its radially innermost to its radially outermost extremity whereby said nut member may engage said outer side surface, when said bolt section is received in said slit, at an angle to lock said components together; and

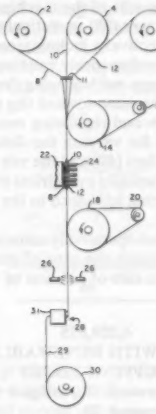
c. clamp means connected to the exterior of one of said components for gripping said cable.

4,059,873

FLUID PROCESS FOR MAKING CONTINUOUS FILAMENT HEATHER YARN

Thomas Larson Nelson, Georgetown, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Division of Ser. No. 609,010, Aug. 29, 1975, abandoned. This application Nov. 2, 1976, Ser. No. 738,168
Int. Cl.[2] D02G *1/16*; D02J *1/08*
U.S. Cl. 28—271 10 Claims



1. A process for making a continuous filament heather yarn, comprising

a. subjecting a plurality of crimped continuous filament yarns of different color and/or dye receptivity and having a total denier of at least 400 to a tension of from 0.5 to 1.25 grams per denier to straighten the crimp of the filaments within each of said yarns and to disentangle and parallelize the filaments,

b. feeding said yarns under tension and in contiguous relationship into a jet intermingling zone,

c. randomly jet intermingling the filaments of said yarns from yarn-to-yarn, and

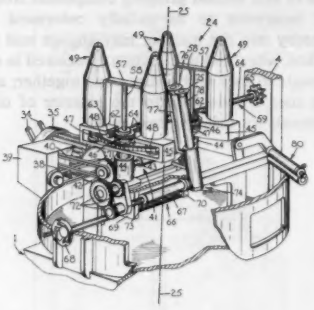
d. withdrawing the intermingled yarn from said zone at a rate which is 4 to 30% less than the feed rate of the yarns to said zone.

4,059,874

FABRIC CUTTING MACHINE FOR PRODUCING STRIPS FROM TUBULAR MATERIAL

Luigi Pisani, Cilavegna (Pavia), Italy, assignor to Rockwell-Rimoldi S.p.A., Milan, Italy

Filed July 9, 1976, Ser. No. 703,990
Claims priority, application Italy, July 18, 1975, 25541/75
Int. Cl.[2] B21D *43/00*; B26D *3/16*
U.S. Cl. 29—2.16 3 Claims



1. A strip cutting machine of the type having a stationary frame with a support frame mounted thereon for rotation about the axis of the machine and for supporting a source of tubular fabric to be cut into strip form by a cutting apparatus carried on the stationary frame, said strip cutting machine comprising:

a. feed means (24) connected to the stationary frame which includes a plurality of rotatably driven stretch and feed rollers (49) radially spaced from and extending substantially parallel to the axis of the machine;

b. a first regulating means (59) operatively connected to said feed means for selectively inclining each of said stretch and feed rollers simultaneously relative to the axis of the machine to produce a withdrawing force on the tubular fabric and direct the same toward the cutting apparatus;

c. means defining a second regulating means (66) connected to said feed means for varying the distance between said stretch and feed rollers (49) and the axis of the machine for maintaining a substantially cylindrical configuration of the fabric while it is being advanced to the cutting apparatus; and

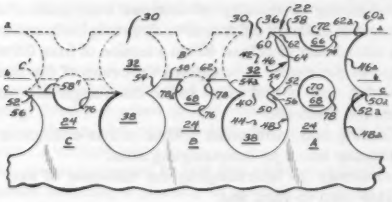
d. variable drive means operatively associated with said feed means for sychronizing the rate of rotation of said feed means (24) with the rate of rotation of the support frame.

4,059,875

TIRE RASP BLADES WITH RENEWABLE CUTTING AND BUFFING EDGES

Wayne E. Jensen, Homewood, Ill., assignor to B & J Manufacturing Company, Glenwood, Ill.

Filed Dec. 12, 1975, Ser. No. 640,041
Int. Cl.[2] B23D *71/00*
U.S. Cl. 29—78 36 Claims



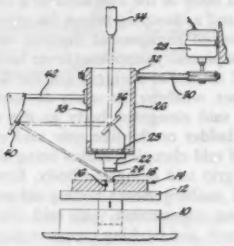
1. Blade for a rotatable tire rasp comprising a sheet metal member having an outer working edge and means spaced from said edge adapted for mounting the blade in said rasp, wherein the working edge thereof includes a tooth having multi-pointed leading and trailing side edges, an outer edge, and an intermediately notched area interrupting the outer edge of said tooth, said leading and trailing side edges of the tooth each having a first laterally projecting prong at the outer edge of the tooth and at least a second laterally projecting prong at a level spaced inwardly of the first prongs.

4,059,876

METHOD OF ALLOYING AND FORMING A VALVE SEAT

Edwin D. Ditto, Bloomfield Hills, Mich., assignor to General Motors Corporation, Detroit, Mich.

Filed Nov. 3, 1976, Ser. No. 738,432
Int. Cl.[2] B23P *15/00*; B23K *26/00*; B23P *3/02*
U.S. Cl. 29—156.7 A 2 Claims



1. A method of alloying and forming a valve seat in a base metal, the valve seat having an axis, comprising the steps of

depositing a mass of alloy materials on the surface of the valve seat,

aligning a forming tool with the valve seat axis for movement between a first retracted position spaced from the valve seat, defining an annular space between the tool and the valve seat, and a second valve seat engaging position,

directing a beam of radiant energy through said annular space between the tool and the valve seat to impinge on the valve seat, said beam being focused at a limited focal spot for heating the said surface of the valve seat and the material deposited thereon at that spot,

sweeping the beam of radiant energy to scan the limited focal spot and peripherally traverse the valve seat to heat the entire valve seat surface and the deposited material to alloying temperature,

then immediately forming the alloyed valve seat by forcefully engaging the forming tool with the alloyed valve seat while the valve seat is at a temperature suitable for forming, whereby the valve seat is alloyed and shaped to a configuration which requires little or no grinding of the alloy.

4,059,877

METHODS FOR FORMING BUBBLE CAP ASSEMBLIES FOR A GAS AND LIQUID CONTACT APPARATUS

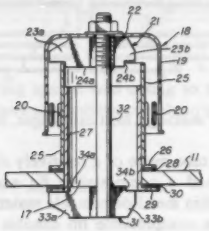
John R. Powers, Port Arthur, Tex., assignor to Texaco Inc., New York, N.Y.

Filed Aug. 6, 1976, Ser. No. 712,451
Int. Cl.[2] B23P *15/00*
U.S. Cl. 29—157 R 9 Claims

1. A method for forming a bubble cap assembly over a hole having upper and lower peripheral surfaces in a tray deck of a gas and liquid contact apparatus comprising the steps of,

a. forming an outwardly extending annular flange on the lower end of a tubular riser having an internal diameter substantially equal to the hole diameter,

b. positioning the riser over the upper peripheral surface of the hole in the tray deck,
c. inserting an annular gasket seal having an inside diameter substantially equal to the hole diameter between the riser annulus flange and the upper peripheral surface around the hole in the tray deck,
d. forming an outwardly extending annular flange on the lower end of an inner tubular sleeve,
e. inserting an annular gasket seal having an inside diameter substantially equal to the hole diameter on top of the inner sleeve annular flange,
f. inserting the inner sleeve up through the hole in the tray deck and the riser thereon contiguous with the inner surface of the riser and hole to clamp the upper and lower



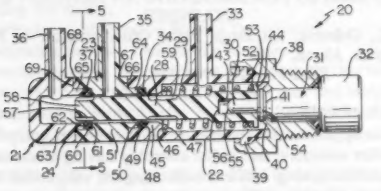
peripheral surfaces of the tray deck between the respective riser and inner sleeve annular flanges,
g. mounting a top spider having a sleeve therein on the riser,
h. mounting a bubble cap on the top spider,
i. inserting a hold-down stud having a lower spider up through the inner sleeve and the riser to protrude through the top of the bubble cap, and
j. attaching a fastening means on the top of the hold-down stud protruding from the top of the bubble cap assembly for applying pressure to both of the annular gasket seals on the upper and lower peripheral surfaces of the hole for assuring proper alignment of the bubble cap assembly relative to the tray deck and for providing a double seal between the tray deck and the bubble cap assembly for minimizing leakage.

4,059,878

METHOD OF MAKING A CONDITION RESPONSIVE VALVE CONSTRUCTION

Byron L. Jackson, and Joseph P. Wagner, both of Knoxville, Tenn., assignors to Robertshaw Controls Company, Richmond, Va.

Division of Ser. No. 596,565, July 16, 1975, Pat. No. 3,989,058. This application Aug. 19, 1976, Ser. No. 715,845
Int. Cl.² B23P *15/00*
U.S. Cl. 29—157.1 R **9 Claims**



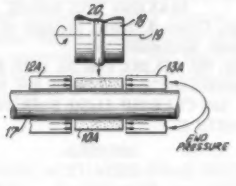
1. A method of making a condition responsive valve construction comprising the steps of forming a first housing means to have an internal chamber therein and an inwardly directed shoulder projecting into said chamber and defining a first valve seat on one side thereof and a spring seat on the other side thereof, said forming step also forming said chamber to define an open end of said first housing means that is spaced outboard of said shoulder thereof, disposing an axially movable valve member in said chamber for controlling said first valve seat, disposing a spring between said spring seat and said valve member to tend to move said valve member in one axial direction in said chamber, interconnecting a condition responsive device to said valve member to move said valve member in the other axial direction upon an increase in sensed condition, securing a second housing means to said first housing means, forming said second housing means with a chamber aligned with said chamber of said first housing means and receiving said valve member therein, forming said second housing means with an inwardly directed shoulder projecting into its respective chamber, forming said first valve seat from a resilient annular member, and disposing said annular member against said one side of said shoulder of said first housing means and against an adjacent side of said shoulder of said second housing means so as to project inwardly beyond said shoulders to sealing engage said valve member, said step of securing said second housing means to said first housing means causing said adjacent side of said shoulder of said second housing means to be disposed in said chamber of said first housing means and, thus, be disposed inboard of said open end of said first housing means.

4,059,879

METHOD FOR THE CONTROLLED MECHANICAL WORKING OF SINTERED POROUS POWDER METAL SHAPES TO EFFECT SURFACE AND SUBSURFACE DENSIFICATION

William J. Chmura, Southington; Ronald S. Slusarski, Berlin, and Charles B. Burk, Collinsville, all of Conn., assignors to Textron Inc., Providence, R.I.

Filed Nov. 17, 1975, Ser. No. 632,709
Int. Cl.² B21K *1/04*; B21H *1/12*
U.S. Cl. 29—148.4 R **21 Claims**



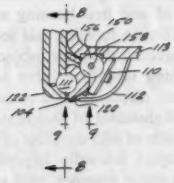
1. A method for producing an annular metal bearing ring by powder metallurgy which comprises,
forming a sintered porous metal ring having a porosity corresponding to a density of about 70% to 90% of true density, coaxially supporting said ring on a rotatable mandrel,
applying restraining clamping pressure to opposite sides of said ring,
and maintaining said clamping pressure while roll-forming a bearing raceway on a circumferential bearing face of said ring by mechanically cold rolling said raceway to a suitable depth to support rolling elements therein, such that the subsurface adjacent said raceway is markedly densified to at least 95% of true density while the remaining portion of said ring is maintained substantially porous over the range of about 80% to 92% of true density,
the amount of clamping pressure being at least sufficient to inhibit growth of said ring during said working while substantially inhibiting cracking of said ring during cold rolling of said raceway.

4,059,880

METHOD OF MAKING AN APPARATUS FOR DYEING AND PRINTING OF MATERIALS

Norman E. Klein, Inman, S.C., assignor to Milliken Research Corporation, Spartanburg, S.C.

Division of Ser. No. 430,527, Jan. 3, 1974, abandoned. This application Aug. 14, 1975, Ser. No. 604,582
Int. Cl.[2] B23P *15/00, 13/00*
U.S. Cl. 29—157 C 4 Claims



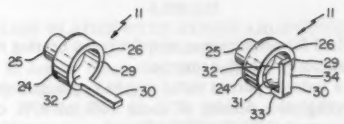
1. The method of making a dye applicator of a gun bar for applying dye to a material comprising the steps of providing a first member with a substantially flat face having a cavity therein, provided a second member with a substantially flat face having a cavity therein, providing at least one groove in the face on one of said members which communicates with said cavity and an outer edge of said face therein, mating said faces of said first and second members so that the cavities of the members form a chamber and providing a clamping force on said members which produces a perpendicular and a parallel force effect with respect to the mating faces to hold said members in engagement and to facilitate alignment of the edges of said faces adjacent said groove.

4,059,881

VENT VALVE ARRANGEMENT AND METHOD OF MAKING THE SAME

Boyd P. Sliger, Concord, Tenn., assignor to Robertshaw Controls Company, Richmond, Va.

Division of Ser. No. 551,282, Feb. 20, 1975, Pat. No. 3,973,729. This application May 17, 1976, Ser. No. 686,819
Int. Cl.[2] B23P *15/00;* F16K *27/00*
U.S. Cl. 29—157.1 R 7 Claims



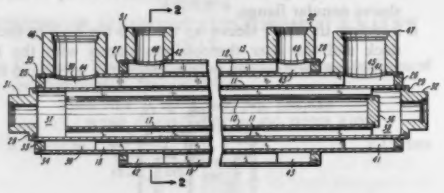
1. A method of making a vent valve arrangement comprising the steps of forming a one-piece valve seat member to have a valve seat opening and a chamber for containing a movable valve member therein that will open and close said valve seat opening, disposing an unattached ball valve member in said chamber through an open end of said one-piece valve seat member, and forming said valve seat member to contain said valve member in said chamber by forming said one-piece valve seat member to have a single integral tab extension disposed adjacent said open end to contain said valve member in said chamber and by bending said single integral tab extension into substantially an L-shaped configuration with one leg thereof being an extension of said open end and the other leg thereof being disposed in front of and spaced outwardly from said open end.

4,059,882

METHOD OF MAKING AN ANNULAR TUBE-FIN HEAT EXCHANGER

John E. Wunder, Dayton, Ohio, assignor to United Aircraft Products, Inc., Dayton, Ohio

Filed May 24, 1976, Ser. No. 689,190
Int. Cl.[2] B23P *15/26, 17/00*
U.S. Cl. 29—157.3 A 8 Claims



1. A method of making a heat exchanger, including the steps of:

a. providing a tube made of a relatively rigid heat conductive metal and a compressible fin annulus comprising corrugated thin metal deformable material,

b. inserting the compressible fin annulus in said tube and providing a central support therefor, said support rigidly backing said fin annulus,

c. applying a radial compressive force to said fin annulus so that all parts thereof are in closely contacting compressive relation to the interior wall of said tube irrespective of irregularities in fin height, the application of compressive forces being accomplished by displacing the tube wall radially inwardly,

d. the fin annulus reacting upon said central support and the tube wall deforming to conform to fin irregularities,

e. prior to applying said radial compressive force inserting in at least one end of said tube a relatively incompressible closure member,

f. said member having a cross sectional dimension to have a relatively loose fit in said tube and the tube wall in being radially inwardly displaced encountering between its ends relatively compressible means in the form of said fin annulus and at least at said one end thereof encountering the firm resistance of said closure member,

g. a single contracting tube therefore closing tightly at least at said one end on an inserted closure member and between its ends engaging and applying a compressive pressure to said fin annulus,

h. and metallurgically bonding together the parts so assembled.

4,059,883

APPARATUS FOR REMOVING AN IGNITION KEY CYLINDER

Ray L. Osborne, Cuyahoga Falls, Ohio, assignor to Milton English, Akron, Ohio

Filed Feb. 25, 1976, Ser. No. 661,402
Int. Cl.[2] B23P *19/04*
U.S. Cl. 29—259 4 Claims

1. An apparatus for removing a lock cylinder, comprising;

a collet assembly, said collet assembly having a conical base portion having resilient collet fingers, said collet fingers having an inwardly projecting lip,

a shaft, said shaft connected to said collet base portion and having an external thread portion,

an annulus having an internal thread engaging said external thread portion and having a shoulder, said annulus engaging said collet base portion to thereby bias said collet fingers inwardly,

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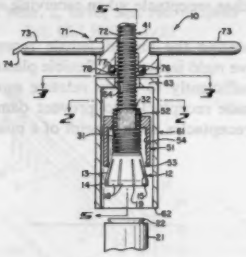
a casing, said casing extending at least partially about said collet assembly,

a lever, said lever engaging said shaft,



said lever bearing against said casing so that tightening of said lever causes said collet assembly to be drawn into said casing.

4,059,884

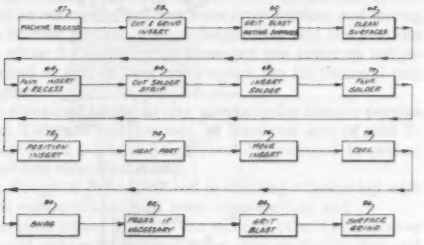
WEAR PART

Theodore C. Weill, 110 Carol Circle, Tylertown, Miss. 39667

Filed Sept. 18, 1975, Ser. No. 614,494

Int. Cl.[2] B23P *7/00*; B22P *19/10*

U.S. Cl. 29—401 E **5 Claims**



1. A method of repairing the wear parts of a wood chipper such as a knife holder, comprising the steps of:

removing material from the worn area of the wear part to form a recess;

forming an insert from a material having a coefficient of thermal expansion substantially equal to that of the material of the wear part, said insert dimensioned to fit within the recess;

fluxing the recess;

positioning a silver alloy filler in the recess;

positioning the insert within the recess;

induction heating the wear part and insert so that bonding occurs by brazing between the wear part and insert, said insert being formed from a surface hardened steel, said fluxing step employing a high temperature, paste form black flux;

grit blasting the mating surfaces of said insert and said recess prior to fluxing the recess, said silver alloy filler material containing approximately 50% silver and having a flow point of approximately 1120° F, said induction heating step including heating at a temperature of approximately 1200° F for a period of at least one minute; and

moving said insert once said heating step is started to insure wetting of the mating surfaces.

4,059,885

PROCESS FOR PARTIAL RESTORATION OF A COKE OVEN BATTERY

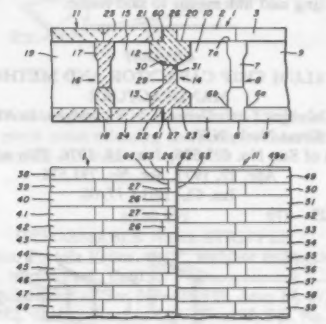
Hans Oldengott, Bockum-Hovel, Germany, assignor to Dr. C. Otto & Comp. G.m.b.H., Bochum, Germany

Filed Mar. 19, 1976, Ser. No. 668,468

Claims priority, application Germany, May 19, 1975, 2512013; May 28, 1975, 2523640

Int. Cl.[2] B23P *7/00*

U.S. Cl. 29—401 F **16 Claims**



1. A process for restoring a damaged part of a battery of coke ovens including the steps of exposing existing masonry for continued use as part of the coke ovens to provide support for flat connecting surfaces such that a lateral expansion joint for the replacement masonry forming a restored part of the coke ovens lies between such flat connecting surfaces and replacement masonry while said flat connecting surfaces form a continuous aligned surface for a horizontal expansion joint connecting with said lateral expansion joint and extending along between the replaced masonry and the existing masonry, selecting a replacement masonry comprising a masonry bridging material having a low thermal expansion property to provide essentially constant dimensional characteristics during heating thereof to the operating temperature of the coke ovens, and arranging said masonry bridging material to close and support said existing masonry while using surfaces on said masonry bridging material to form said flat connecting surfaces for providing said lateral expansion joint for the renewed part of the coke ovens.

4,059,886

HYDRAULIC ACTUATED GRAB BUCKET

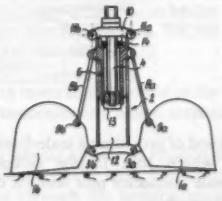
Jean-Pierre Luc Bricon, Venissieux, France, assignor to International Harvester Company, Chicago, Ill.

Division of Ser. No. 656,237, Feb. 9, 1976, Pat. No. 4,047,313.

This application Dec. 1, 1976, Ser. No. 746,990

Int. Cl.[2] C02F *3/60*

U.S. Cl. 29—426 **2 Claims**



1. A method of converting a digging bucket suspended from a frame to a rehandling bucket, said digging bucket having a pair of mating shells, each of which has inner and outer pivot

connections, a piston including a rod affixed to said frame, a cylinder reciprocably mounted upon and sealingly engaging said rod and piston, link means pivotally connected between said cylinder and said outer pivot connections and pivot means carried by said frame and pivotally connecting said inner pivot connections to said frame; said method comprising the steps of:

disconnecting said link means from said cylinder;

disconnecting said pivot means from said inner pivot connections;

connecting said inner pivot conections to said cylinder; and,

connecting said link means to said frame.

4,059,887

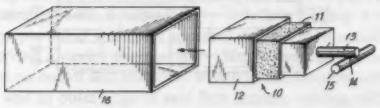
TANTALUM CHIP CAPACITOR AND METHOD OF MANUFACTURE

John L. Galvagni, Little Genesee, N.Y., assignor to AVX Corporation, Great Neck, N.Y.

Division of Ser. No. 695,596, June 14, 1976. This application Apr. 27, 1977, Ser. No. 791,511

Int. Cl.[2] B01J *17/00*

U.S. Cl. 29—570 **9 Claims**



1. The method of manufacturing a capacitor from a capacitor subassembly which includes a cathode body and an anode lead, comprising the steps of providing a metal case member open at least at one end and having a hollow interior, inserting said subassembly into said case member, forming a first electrical connection between said cathode body and a first portion of said case member, forming a second electrical connection between said anode lead and a second portion of said case member longitudinally spaced from said first portion, introducing into the interior of said case member a quantity of a hardenable liquid polymeric material in quantity sufficient substantially to fill the void within said case surrounding said capacitor subassembly and lead, causing said material to harden, and thereafter removing a section of said case between said first and second portions at an area in registry with said polymeric material completely to divide said case into first and second sections mechanically connected but electrically isolated by said polymeric material.

4,059,888

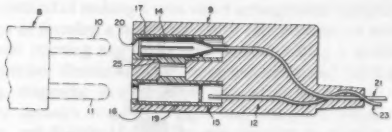
METHOD OF MAKING A PIN ACTUATOR CONNECTOR

David T. Leh, Pottstown, Pa., assignor to Sperry Rand Corporation, New York, N.Y.

Continuation of Ser. No. 444,585, Feb. 21, 1974, abandoned. This application Aug. 7, 1975, Ser. No. 602,867

Int. Cl.[2] H01R *43/00*

U.S. Cl. 29—629 **3 Claims**



1. The method of providing a male-female electrical connector device where split female receptacles may receive misaligned male connector pins without damage thereto comprising the steps of:

a. surrounding each of said split female receptacles with a respective rigid jacket of plastic material,

each said receptacle being spaced from the walls of its rigid jacket, thereby allowing for expansion of said receptacle upon receipt of a misaligned male pin;

b. providing hinge means between said rigid jackets, thereby allowing one receptacle to be repositioned independently of the other receptacle when receiving a misaligned male pin

c. encapsulating the hinged female receptacles and their respective rigid jackets in a flexible plastic material which yields sufficiently to allow relative movement between said female receptacles to prevent damage to said split female receptacles upon receipt of a misaligned male pin.

4,059,889

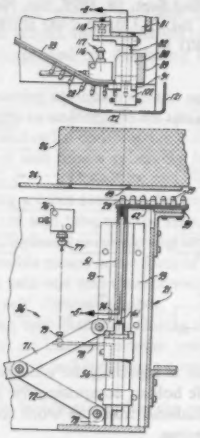
QUILTING MACHINE

Arthur J. Randolph, Santa Rosa, and Richard M. Boyce, Windsor, both of Calif., assignors to Arthur J. Randolph, Santa Rosa, Calif.

Continuation-in-part of Ser. No. 616,199, Sept. 24, 1975, Pat. No. 3,995,359. This application Dec. 6, 1976, Ser. No. 748,132

Int. Cl.[2] B23Q *7/10*

U.S. Cl. 29—706 **6 Claims**



1. A quilting machine for rapidly inserting a two-part quilting button having a male and a female button part through a workpiece comprising

a male button part holder adapted to receive male button parts contiguously fed thereto and including resiliently displaceable means receiving and holding each successive male button part,

a single displacement male button part drive means for forcing a male button part axially thereof into a female button part,

a female button part holder adapted to receive successive female button parts fed thereto and including a movable drive member for displacing a female button part toward said male button part holder, and

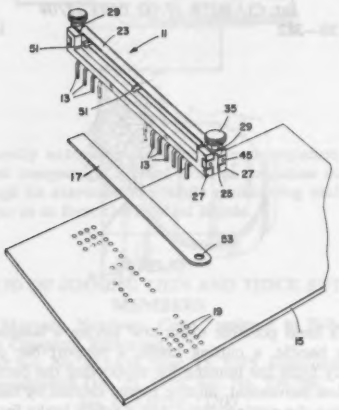
means moving said drive member to drive a female button part through a workpiece and means actuating said male button part drive means for driving a male button part through a female button part that extends through a workpiece.

4,059,890

PIN LOADING SYSTEM

Theodore R. Sherwood, Sunnyvale, Calif., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Mar. 1, 1976, Ser. No. 662,643
Int. Cl.[2] H05K 3/32
U.S. Cl. 29—739 7 Claims



1. A loading system for loading at least one contact pin onto a board having an upper side and a lower side and having at least one mating hole therefor which system comprises:

a. at least one elongated clamp rotatably mounted about its longitudinal axis having end portions with a notch therein and an outwardly inclined inner cross-section, and having an interior portion of lesser height than said end portions to allow for exposure of a contact pin common rail attached to said at least one contact pin for removal tool access;

b. an elongated spacer having a rectangular interior portion and T-shaped end portions, at least one arm of said T-shaped end portions being pivotally engaged to said at least one elongated clamp;

c. an elongated cylindrical rod in abutting relationship with said outwardly inclined inner cross-section; and

e. elevation means to adjust the location of said rod relative to said outwardly inclined inner cross-section so that said at least one elongated clamp rotates about said longitudinal axis with the lower edge of said at least one elongated clamp forcefully engaging said at least one contact pin to hold said at least one contact pin within said loading system.

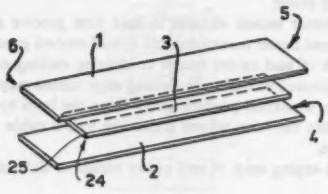
4,059,891

BLADE AND IMPROVED HOLDER FOR IT

Georgios Panagiotoulis, II, Velvendous Street, Athens, Greece

Filed Oct. 20, 1975, Ser. No. 623,610
Claims priority, application Greece, Oct. 25, 1974, 5464; Nov. 29, 1974, 5650; Aug. 28, 1975, 7284
Int. Cl.[2] B26B 21/22, 21/54
U.S. Cl. 30—50 5 Claims

1. A holder for a blade comprising a pair of spaced limbs permanently fixed in position relative to one another and having opposed internal surfaces defining an elongate seat which in use receives a strip blade, the seat having a depth less than the depth of a blade to be used so that the cutting edge of the blade projects beyond the spaced limbs and the spacing between the limbs being such that a blade to be used is held in position during use primarily by surface adhesion between said opposed internal surfaces and the surface of the blade, the depth of the seat being limited by means forming the back of the seat against which the blade abuts to limit penetration of the blade between the limbs, said limit means extending only a part of the length of said seat so that a pivot point is formed spaced from one end of the seat, whereby rearward pressure on



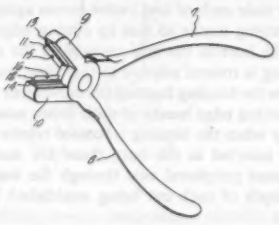
the blade at said one end of the seat causes the blade to pivot about said pivot point releasing the blade at the other end of the seat to enable removal.

4,059,892

DEFORMABLE WIRE STRIPPER

Dennis Siden, Portola Valley, Calif., assignor to Raychem Corporation, Menlo Park, Calif.

Continuation-in-part of Ser. No. 480,821, June 19, 1974, Pat. No. 3,931,672. This application Oct. 29, 1975, Ser. No. 626,780
Int. Cl.[2] H02G 1/12
U.S. Cl. 30—90.1 19 Claims



1. A tool for stripping insulation from an insulated conductor which comprises in combination a deformable blade means having a Rockwell hardness between M30 and L115, said blade mean including a tapered edge and being comprised of a material exhibiting a deformation less than the deformation of the insulation and greater than that of the conductor and means for exerting a force on said insulated conductor opposite the point at which said deformable blade means engages the insulated conductor to urge said insulated conductor into engagement with said deformable blade means so that said deformable blade means cuts through said insulation and deforms upon contact with said conductor.

4,059,893

COAXIAL CABLE CUTTING TOOL

Thomas F. Solury, 150 Colony Drive, Sierra Madre, Calif. 91024

Filed July 19, 1976, Ser. No. 706,790
Int. Cl.[2] H02G 1/12
U.S. Cl. 30—90.1 16 Claims

1. A tool for cutting material from cable of the type having a central conductor concentrically within insulation material, said tool comprising:

a rotatable housing having an axis of rotation and having a bore extending along said axis from one end of the housing at least part way through the housing toward its other end, into which there may be inserted a length of the cable, and having a peripheral wall between the ends;

a first groove means and a second groove means each ex-

tending through the housing in a direction transverse to said axis and opening into the bore;

spacing means between the first and second groove means separating the first and second groove means axially from each other;

first cutter means slidable in said first groove means and second cutter means slidable in said second groove means, each of said cutter means containing cutting edge means positioned so that each cutting edge means may be moved from a normal position away from the bore to a position within the bore where it can cut into a cable within the bore;

means urging each of said cutter means to slide in the direction which maintains its cutting edge means away from the bore;

movable means attached to the housing adapted to separately slide each of said cutter means against the force of said urging means so that its cutting edge means moves into the bore to cut into material of the cable when the housing is rotated relative to the cable; and

means on the housing limiting the movement into the bore of the cutting edge means of each cutter means;

whereby when the housing is rotated relative to a length of cable inserted in the bore there are made two axially separated peripheral cuts through the wall of the cable, the depth of each cut being established by the limiting means.

4,059,894

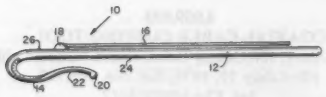
CAULKING GUN CARTRIDGE OPENING TOOL

Stanley Yavor, 209 Jackson St., Berwick, Pa. 18603

Filed Aug. 24, 1976, Ser. No. 717,123

Int. Cl.² B26B *27/00*

U.S. Cl. 30—296 A **6 Claims**



1. A caulking gun cartridge opening tool comprising an elongated plate, a portion of one marginal edge of the plate having a knife-like edge, a portion of the plate adjacent one end thereof being disposed folded into an S-shape extending substantially parallel to a first lateral surface of the plate, a needle-like rod, one end of the rod having a ball-like shape, a socket, said socket fixedly secured to a second lateral surface of the plate, said ball-like shape being partially captured in said socket the length of the rod being shorter than the length of the plate.

4,059,895

FULL POSITION SAFETY BRAKE FOR PORTABLE CHAIN SAW

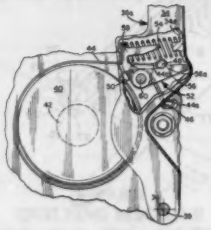
Sidney Hirschkoff, Los Angeles, Calif., assignor to McCulloch Corporation, Los Angeles, Calif.

Continuation-in-part of Ser. No. 515,047, Oct. 15, 1974, Pat. No. 3,964,333. This application Apr. 19, 1976, Ser. No. 678,169

The portion of the term of this patent subsequent to June 22, 1993, has been disclaimed.

Int. Cl.² B27B *17/00*; B60T *13/04*

U.S. Cl. 30—382 **16 Claims**



1. In a hand portable chain saw having a housing with a carrying handle, a cutting chain, a support bar projecting forwardly from the housing for supporting the cutting chain for endless movement, motive means carried by the housing for driving the cutting chain, and a safety brake for stopping the cutting chain, the improvement in said safety brake comprising

A. safety bar means mounted on said housing for swinging movement relative to a first axis and arranged to be swung forward upon being struck by an operator, said safety bar means having a wrap-around configuration extending around the top and sides of said housing forward of said carrying handle,

B. a flexible brake band having a first end secured to the housing and a second end coupled to said safety bar means for movement therewith such that forward swinging of said safety bar means moves said brake band into frictional braking engagement with said motive means to stop said cutting chain, and

C. a single spring member engaged between said safety bar means and the housing at a location spaced from said first axis and for exerting resilient force longitudinal to said forward direction, said spring member being arranged constantly to bias said safety bar means forward to said braking position, and further arranged to impose yieldable latching force on said safety bar means to resist forward movement of said safety bar means and thereby prevent inadvertent brake engagement with said motive means.

4,059,896

PROCESS FOR CONVERTING ALUMINUM SCRAP INTO USEFUL PRODUCTS

Akira Asari, Osa, and Kenzou Tatsuno, Kobe, both of Japan, assignors to Kobe Steel, Ltd., Kobe, Japan

Continuation-in-part of Ser. No. 692,753, June 4, 1976, abandoned, which is a continuation of Ser. No. 573,085, April 30, 1975, abandoned. This application July 1, 1976, Ser. No. 701,578

Claims priority, application Japan, Dec. 27, 1974, 50-2673; Dec. 27, 1974, 50-2676; Dec. 24, 1975, 50-3166

Int. Cl.² B21C *23/04*

U.S. Cl. 29—403 **7 Claims**

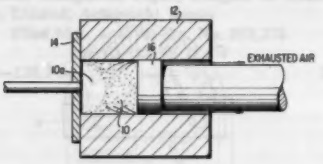
1. A process for converting aluminum scrap into a finished article, comprising the steps of:

compacting the aluminum scrap at ambient temperature into a billet having a density between 1.8 and 2.4 g/cm³;

heating the compacted billet to a temperature between 350° and 550° C;

compacting the heated billet into a dense mass, having a

density above 2.4 g/cm³, while maintaining a condition under which the air pressure at the outer periphery of the billet is lower than that in the central portion of the billet; and



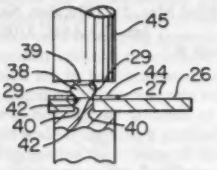
subsequently extruding the billet after completion of the second compaction thereof from an extrusion container through an extrusion die, while maintaining said condition, so as to form the finished article.

4,059,897

METHOD OF JOINING THIN AND THICK SWITCH MEMBERS

Edgar E. Marquis, Newtown, Conn., assignor to Robertshaw Controls Company, Richmond, Va.

Division of Ser. No. 613,634, Sept. 15, 1975, abandoned. This application Oct. 22, 1976, Ser. No. 734,756
Int. Cl.² B23P *11/00*
U.S. Cl. 29—432.1 7 Claims



1. A method of joining a relatively thin metal switch blade member to a relatively thick terminal member to form as assembly for an electrical switch comprising the steps of disposing one surface of said terminal member against one surface of one end of the switch blade member, punching a part of said terminal member through an unblanked part of said one surface of said one end of said switch blade member so that said part of said terminal member extends beyond the opposed surface of said switch blade member, and staking said part of said terminal member to said opposed surface of said switch blade member to secure said members together whereby the other end of said switch blade member is carried in cantilevered fashion by said terminal member to perform a contact switching function.

4,059,898

METHOD OF MAKING A SMALL ELECTRIC MOTOR

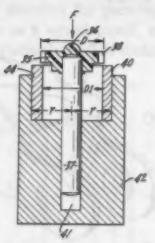
Gerald L. Adair, 419 Dane St., Woodstock, Ill. 60098

Division of Ser. No. 588,011, June 18, 1975, Pat. No. 4,035,676. This application Sept. 20, 1976, Ser. No. 724,589
Int. Cl.² H02K *15/02*
U.S. Cl. 29—598 1 Claim

1. A method of assembling a cylindrical rotor and a metal rotor shaft into a rotor assembly for a subfractional dynamoelectric machine comprising the following steps:

A. presenting to one end of the rotor a circular hub molded substantially concentrically to one end of the shaft, said hub having a toothed periphery of deformable and shearable plastic material softer than the rotor, and the outer diameter of the hub being larger than the inner diameter of the rotor;

B. press-fitting the hub into the inner diameter of the rotor, while maintaining the outer diameters of the shaft and the rotor in concentric relation, the teeth of the hub distorting



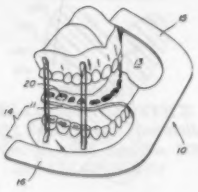
during press fitting to compensate for any eccentricity between the peripheral ends of the teeth and the inner diameter of the rotor.

4,059,899

METHOD FOR FITTING DENTURES TO VARIOUS JAW POSITIONS

John P. Dyal, 408 Coronado Tower, 6006 N. Mesa, El Paso, Tex. 79901

Filed Oct. 23, 1975, Ser. No. 625,026
Int. Cl.² A61C *13/08*
U.S. Cl. 32—2 7 Claims



2. A denture fitting device comprising a plurality of indexed means each comprising a rigid bite form having index markings preformed on the upper and lower sides thereof for horizontally and simultaneously pre-positioning upper and lower dentures with respect to each other according to any one of many different horizontal relationships of a patient's natural jaw set, depending upon which of said indexing means is used for a given patient, means for resiliently attaching said dentures over said preformed markings in said pre-positioned relationship upon a selected one of said indexed means, and means for simultaneously fitting both said upper and lower dentures to a patient's mouth while said dentures are attached together and to said selected indexed means according to said preformed markings.

4,059,900

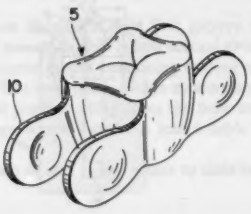
CLIP-ON DENTAL RESTORATION AND TOOLS FOR REMOVING SAME

William C. Orthwein, P.O. Box 3332, Carbondale, Ill. 62901

Continuation-in-part of Ser. No. 613,196, Sept. 15, 1975, abandoned. This application Nov. 30, 1976, Ser. No. 746,193
Int. Cl.² A61C *13/22*
U.S. Cl. 32—5 15 Claims

1. A removable dental restoration for filling an edentulous space defined at least at one end by a natural tooth, comprising a central body portion shaped to simulate a natural tooth, said central body portion comprising a pair of substantially parallel resilient longitudinal walls, a pair of substantially rigid end walls substantially perpendicular to said longitudinal walls, an upper wall and a lower wall; and gripping means extending from each said longitudinal wall for at least partially encircling

and releasably gripping an adjacent natural tooth, whereby said gripping means resiliently clamps said restoration and can be released by applying pressure inwardly against said longitudinal walls, said substantially rigid end walls serving as fulcrum points about which said gripping means pivot for movement away from gripping engagement with said adjacent natural tooth when such inward pressure is applied.

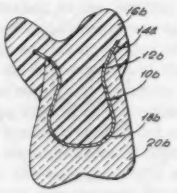


4,059,901

PORCELAIN FUSED TO METAL DENTURE TOOTH RETAINER

Robert Spalten, 745 Fifth Ave., New York, N.Y. 10022

Filed Aug. 20, 1975, Ser. No. 606,190
Int. Cl.[2] A61C *13/00*
U.S. Cl. 32—8 4 Claims



1. A denture tooth for attachment to a denture appliance having a molded denture base conforming to the gum areas of the mouth, said denture tooth comprising a body and an extending metal retainer made of a single piece of metal terminating in a head portion for attachment to the denture base, said metal retainer having embedded in said body, a metal retention portion, U-shaped in cross-section, extending longitudinally towards the biting edge of the tooth for the major portion of the tooth length, providing a large engaging surface to increase its retention and reinforcing characteristics with the tooth body, the anterior and posterior portions of the U-shaped cross-section extending from the tooth body to form the head portion for attachment to the denture base.

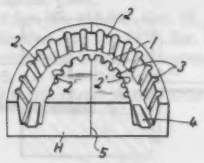
4,059,902

TRAY FOR PREPARING A DENTIFORM MODEL USED FOR AN OPERATION ON A DENTAL TECHNIC

Yoichi Shiokawa, No. 1, 206, Ooazaiwamurada, Saku, Nagano, Japan (385)

Filed May 5, 1976, Ser. No. 683,457
Claims priority, application Japan, May 7, 1975, 51-8222
Int. Cl.[2] A61C *13/22*
U.S. Cl. 32—11 1 Claim

1. A tray for preparing a dental model, the tray comprising a single, integral flat body, an arcuate channel formed in a flat surface of the body and simulating the curvature of a row of teeth, the channel having side walls which are outwardly tapered in the direction of said surface, substantially vertical grooves of arcuate cross section formed at regularly spaced intervals along the entire extent of each of the side walls, the arcuate channel also having a base and open ends and, formed in the base contiguous with each of the open ends of the channel, a respective wedge shaped notch for assisting removal by means of a driver blade of a hard body cast in the channel, the open ends of the channel being adapted to be closed by adhesive tape and the notches being adapted to be filled with a soft substance prior to the filling of the channel with a material which will set to form said hard body.

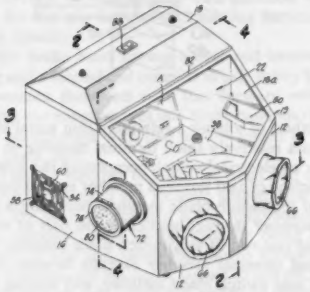


4,059,903

CONTROLLED ENVIRONMENT WORK ENCLOSURE

Meyer Piet, Arcadia, and Dean Gaylord Giles, Valinda, both of Calif., assignors to Futurecraft Corporation, City of Industry, Calif.

Filed Mar. 31, 1976, Ser. No. 672,510
Int. Cl.[2] A61C *3/00*
U.S. Cl. 32—40 R 10 Claims



1. A controlled subatmospheric pressure environment work enclosure comprising:

a. a hollow housing defining a work space;

b. a work platform disposed intermediate said work space;

c. at least one air inlet provided in said housing above said work platform for permitting air to be drawn inwardly from the exterior of said housing;

d. an air outlet provided in said housing below said work platform adapted to permit air to be ejected from said housing;

e. suction means for maintaining subatmospheric pressure in said work enclosure and for continuously drawing a stream of air inwardly through said air inlet and then rapidly in a downward direction through said work space past said work platform toward said air outlet for ejection therethrough; and

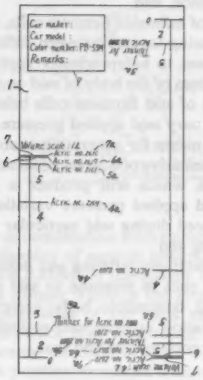
f. filter means interposed in said stream of air for filtering the air flowing past said work platform thereby preventing vapors and particulate materials contained therein from escaping from said work enclosure to the exterior of said housing through said air outlet.

4,059,904

PREPARATION OF COATING COMPOSITION OF SPECIFIED COLOR

Hidetaka Sato, Amagasaki, Japan, assignor to Kansai Paint Company, Limited, Amagasaki, Japan

Filed Mar. 4, 1975, Ser. No. 555,278
Int. Cl.[2] G01F *23/04*
U.S. Cl. 33—126.7 A 2 Claims



1. A method of measuring off specified volumes of coloured base coating compositions to be formulated into a coating composition of a specified colour which comprises the steps of:

a. removably inserting on a measuring apparatus a card for measuring off specified volumes of coloured base coating compositions which are to be formulated into a coating composition of a specified colour, wherein said card comprises a scale for indicating the volumes of solvent and coloured base, said scale containing a graduation adjacent to a zero line and indicating the volume of the solvent and graduation lines subsequent to the graduation line to indicate the volumes of coloured base coating compositions and arranged in order of progressively decreasing volumes,

b. setting a pointer to the solvent graduation line on the card, whereby a probe member vertically movable with the pointer in a constant ratio of movement thereto is brought to a specified position within a container on the measuring apparatus,

c. pouring the solvent into said container until it is ascertained with the unaided eyes that the surface of the solvent has contacted the probe member thereby forming a solvent layer

d. progressively setting the pointer to the coloured base coating composition graduation lines, and

e. measuring off specified volumes of coloured base coating compositions being poured into the container for measurement, in the order of progressively decreasing volumes of the base coating compositions by ascertaining with the unaided eyes that the surface of the solvent layer present above the base coating compositions has contacted the probe member.

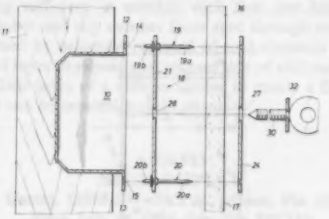
4,059,905

APPARATUS FOR LOCATING ACCESS OPENINGS FOR ELECTRICAL OUTLET BOXES IN COVERING MEMBERS

James H. Wieting, 12914 Memorial Drive, Houston, Tex. 77024

Filed Feb. 26, 1976, Ser. No. 661,624
Int. Cl.[2] G01B *5/14*
U.S. Cl. 33—180 R 7 Claims

1. Apparatus for locating an access opening to an electrical outlet box concealed behind a covering member comprising a locator pin assembly for mounting on the outlet box, said assembly having a plate member and sharp-pointed locator pins extending perpendicularly from both sides of the plate member with the pin on one side extending a relatively short distance from the plate member for piercing a relatively thin covering member, such as a wood panel, and the pin on the other side extending a relatively longer distance from the plate



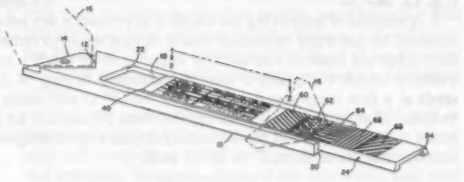
member for piercing a relatively thick covering member, such as wallboard, means for mounting the locator pin assembly on the outlet box with the proper length of pin positioned to pierce the wall covering, and a template for positioning on the pin after it has pierced the wall covering to indicate the proper position for the access opening.

4,059,906

TIE LOCATING DEVICE

George W. Kurtz, 611 Suhill Drive, Huntsville, Ala. 35802

Filed Nov. 10, 1976, Ser. No. 740,424
Int. Cl.[2] G01B *3/08*
U.S. Cl. 33—180 R 4 Claims



1. A necktie tying aid comprising:

first and second elongated members, said members being slidably attached and relatively movable along a longitudinal path;

a reference notch adjacent to one end of said first member for receiving and referencing the narrow width end of a tie when positioned around the neck of the user;

adjustable stop means for interacting between said first and second members for setting said aid to a selected overall length; and

index means by which the length of the wide end of the tie is referenceable, and comprising a plurality of adjacent, individually coded, reference areas extending longitudinally along said second member;

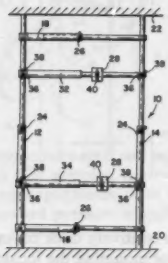
whereby, for a selected overall extended length of said aid, a tie would be tied by first placing it around one's neck at an approximate hanging position, placing the narrow end at said reference notch on said first member, extending said second member to a preset stop position, adjusting the tie position until the wide end of the tie is positioned on a selected reference mark on said second member, and tying a tie knot between the hanging lengths of the tie.

4,059,907

ELECTRICAL OUTLET AND SWITCHBOX LOCATOR

Howard Dauber, 24 Heron Lane, Commack, N.Y. 11725

Filed Aug. 24, 1976, Ser. No. 717,130
Int. Cl.² G01B 5/14, 3/00
U.S. Cl. 33—174 G 7 Claims



1. A tool for locating and marking an electrical outlet or the like on a wall panel prior to installation comprising:

a framework including a spaced pair of horizontal telescoping members connected at the ends thereof to a pair of spaced vertical telescoping members;

at least one horizontal bar between said pair of vertical members slidably mounted at its opposite ends on said vertical members for vertical movement therealong; and

a template for locating an electrical outlet or the like slidably mounted on said horizontal bar for horizontal movement therealong.

4,059,908

METHOD FOR IMPROVING THE STABILITY OF SEEDS

Walton J. Smith, East Grafton, N.H. 03240

Filed Mar. 30, 1976, Ser. No. 671,996
Int. Cl.² F26B 5/04
U.S. Cl. 34—15 4 Claims

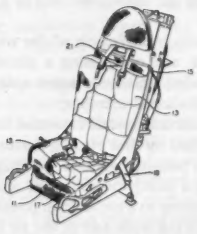
1. A method of improving the stability of primarily dry seeds obtained by naturally or commercially drying seeds to reduce their moisture content and thereby improve their vitality and viability which comprises a step of secondary drying of the seeds at a first temperature of from 50° to 60° C and under a vacuum of at least 100 microns Hg for from 30 minutes to 24 hours and then repeating the secondary drying step at temperature increments of from 5° to 20° C each.

4,059,909

NEURAL RECEPTOR AUGMENTED G SEAT SYSTEM

Gerald Joseph Kron, Binghamton, N.Y., assignor to The Singer Company, Binghamton, N.Y.

Continuation of Ser. No. 224,763, Feb. 9, 1972, abandoned. This application Aug. 9, 1974, Ser. No. 496,131
Int. Cl.² G09B 9/08
U.S. Cl. 35—12 E 21 Claims



1. Apparatus for providing an occupant of a vehicle simulator with a realistic sensation of G forces associated with a particular vehicular maneuver or motion, comprising:

a. a seat for said occupant comprising:

1. a supporting structure;

2. a plurality of inflatable air cells arranged in side-by-side relationship on said supporting structure, said air cells supporting the body of said occupant, the degree of inflation of said air cells being controllable to cause body excursion, and

3. a plurality of inflatable firmness cells, each of said firmness cells being located between different air cells and said occupant to independently apply pressure to selected portions of the body of said occupant, the degree of inflation of said firmness cells being controllable to selectively vary said applied pressure.

b. coordination means for generating coordinated command signals representative of degrees of inflation of said air and firmness cells which will produce a compatible body excursion and applied pressure variation comparable to that experienced during said particular vehicular maneuver or motion; and

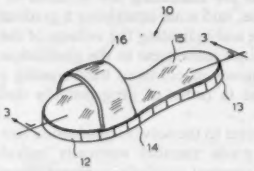
c. means for selectively inflating and deflating said air cells and firmness cells in response to said command signals, whereby said compatible body excursion and applied pressure variation provide said realistic sensation of G forces to the occupant of said seat.

4,059,910

FOOTWEAR APPARATUS

Kenneth Bryden, 1525 G & H Drive, Kissimmee, Fla. 32741, and Norman C. Barrett, 18 Sea Gull Drive, Vero Beach, Fla. 32960

Filed Dec. 23, 1976, Ser. No. 753,633
Int. Cl.² A43B 13/00, 3/12; A43D 0/00
U.S. Cl. 36—103 9 Claims



1. A footwear apparatus comprising in combination:

a plurality of elongated wooden members of a generally uniform cross-section, each shaped to receive an adjacent member, and having a predetermined shape to collectively form a foot support;

a pair of end elongated wooden members shaped to form the toe and heel end members of a foot support;

flexible connecting means attached at one side of each wooden member to hold said wooden members together in a spaced relationship to each other and to allow separation of said wooden members when said flexible connecting means is flexed;

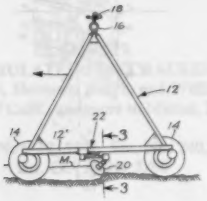
an upper footwear portion attached to said flexible connecting means to attach said flexible means and wooden members to a wearer's foot, thereby providing a piece of footwear, said upper footwear portion having a flat flexible portion having the same general shape as the flexible connecting means, and forming a pair of flexible portions connecting to said plurality of elongated wooden members; and

said upper footwear portion flat flexible portion also having one portion of a hook and loop material attached thereto and said flexible connecting means is a second portion of a hook and loop material whereby said upper footwear portion and said wooden members can be removably attached to each other.

4,059,911
TRACK FILLER ATTACHMENT FOR CENTER PIVOT IRRIGATION SYSTEMS

Roland C. Bean, and Bruce L. Bean, both of Star Route, Burley, Idaho 83318

Filed Sept. 8, 1975, Ser. No. 611,179
Int. Cl.² E02F 5/22
U.S. Cl. 37—142.5 9 Claims



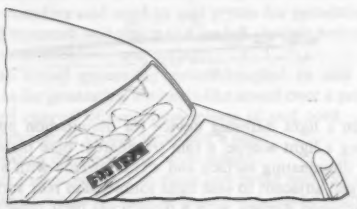
1. A track filler in combination with a center pivot irrigation system having a plurality of support towers each mounted on wheels which, upon rotation of the system, retrace their paths to form depressed annular tracks in the ground by displacing earth to the opposite sides of the track and forming raised mounds thereof, the track filler comprising:

earth moving means attached to each wheelmounted support tower in position to extend transversely across and engage said opposed earth mounds upwardly from substantially ground level and arranged upon repeated rotation of the irrigation system to move the mounded earth back into the track, whereby substantially to level the ground across said track.

4,059,912
IDENTIFICATION STICKER

James D. Noah, 2300 Race St., Fort Worth, Tex. 76111

Filed Aug. 19, 1976, Ser. No. 715,919
Int. Cl.² A44C 3/00
U.S. Cl. 40—2 R 7 Claims



1. A display adapted to be attached to an object, comprising:

three sheets of material laminated together and comprising a first layer, a second intermediate layer, and a third layer; said second intermediate layer being sandwiched between said first and third layers;

each of said layers having respective first and second opposite sides;

said first layer being removably secure to said first side of said second intermediate layer with an adhesive such that when said first layer is removed, said first side of said second intermediate layer may be secured to an object with said adhesive;

said first side of said third layer being removably secure to said second side of said second intermediate layer;

said second side of said third layer having a color different from that of said second side of said second intermediate layer;

a plurality of spaced apart groups of like elements of a predetermined shape kiss cut only into said third layer;

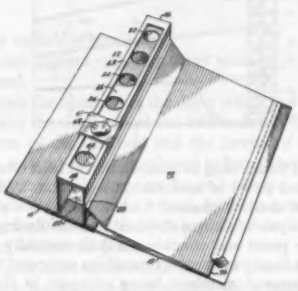
said elements being separately removable to expose said second side of said second intermediate layer within the spaces resulting from removal of said elements for forming respective different symbols and which symbols are readily distinguishable due to the difference in color between said second sides of said second intermediate and third layers;

said elements of each said group being located in respective rows and columns adjacent and contiguous each other and being sufficient in number such that any letter of the alphabet and any number from zero through nine may be formed by selective removal of said elements from said third layer to expose said second side of said second intermediate layer of a different color to create a final design that can be secured to said object.

4,059,913
SLIDE DISPLAY

Federico Garcia, 12865 SW. 54th St., Miami, Fla. 33175

Filed July 21, 1976, Ser. No. 707,310
Int. Cl.² G02B 7/02
U.S. Cl. 40—64 A 6 Claims



1. A back panel having a fold line thereacross in the central zone defining a first portion and a second portion on opposite sides respectively of the fold line and including,

a strip zone included in the first portion parallel to the fold line with one edge of the strip zone being closely adjacent the fold line, the strip having a plurality of aligned spaced windows therealong and a retainer means to hold a piece of film in each of the windows,

a viewing box comprising a first and a second side wall in spaced parallel relation with an upper edge and a lower edge and comprising a roof having a first end and a second end spanning the upper edges of the side walls, said roof having a plurality of viewing openings in registry with the windows of the strip zone,

means connecting the lower edges of the side walls to the back panel along the strip edges,

a slide on the box and including a magnifying means and guide track means connecting the slide for longitudinal movement across the box between the first and second end of said roof,

a pull member having a first end and a second end, the first end of said pull member being connected to the first side wall of said box and said first side wall being adjacent said fold line and the second end being connected to the second portion of said back panel,

hinge means at the connection of said pull member and said first side wall and said back panel and hinge means included in said means connecting the lower edges of said side wall to said second portion of the back panel, the length of the pull member and the distance between (a) the first side wall of the box at the connection of the pull member and the said first side wall and (b) the second portion of the back panel being a ratio such that the angle opposite the length of the pull member is about 90°.

whereby the box is adapted to collapse when the back panel is folded along the fold line and the box is adapted to be

erected with the first and second side wall in perpendicular relation to the first portion of the back panel when the portions of the back panel are in a parallel plane.

4,059,914

PANEL DEVICE

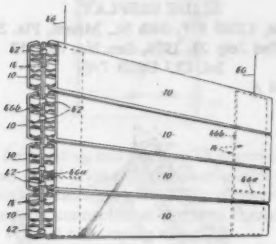
Charles Edward Dobson, 21 Easton Close, Fishponds, Bristol, England

Filed Apr. 1, 1976, Ser. No. 672,601

Claims priority, application United Kingdom, Apr. 2, 1975, 13736/75

Int. Cl.² G09F *7/18*

U.S. Cl. 40—125 F **7 Claims**



1. A board comprising in combination at least one essentially rigid extruded panel of uniform cross-section, said cross-section being of shallow channel form to provide a planar front surface and a pair of flanges directed rearwardly from opposite edges of the panel and concave on their mutually facing surfaces; and at least two support members arranged behind said panel, the support members being elongate in the direction transverse to the direction of extrusion of said panel and arranged in parallel spaced apart relationship, each support member being a relatively short length cut from an extension so that it is elongate in the direction transverse to the direction of extrusion, the cross-section of the support member extrusion providing a flat base and a plurality of pairs of lugs projecting from at least one face of the base, the pairs of lugs being equidistantly spaced apart across the cross-section so as to define a unit center-to-center spacing, the outer surfaces of each pair of lugs being mutually outwardly convex so as to be spaced apart at their ends which join with the base and at their ends remote from the base and more widely spaced apart intermediate said ends, the lugs being of a thickness which allows them to be resiliently deflectable towards each other to a small degree; the overall width of said panel in the direction transverse to its direction of extrusion being substantially a multiple of said unit center-to-center spacing, such that the panel can be pushed onto the support members by movement in a rearward direction for a snap fit of the rearmost edge portions of the flanges over the mutually outermost lugs of separate pairs of lugs on each support member and a friction fit of said mutually inwardly facing surfaces of the flanges on the lugs.

4,059,915

SIGN ASSEMBLY

Frances R. Owens, Rte. 2, Austell, Ga. 30001

Filed June 7, 1976, Ser. No. 693,477

Int. Cl.² G09F *1/00*

U.S. Cl. 40—125 H **4 Claims**

1. A sign assembly comprising, in combination:

a. a standard including a curved upper portion, a lower portion having means thereon for engaging the ground to support said standard in an upright position and an elongated portion interconnecting said upper portion and said lower portipn;

b. a sign adapted to receive indicia for display rotatably mounted on said elongated portion between a display position and a stored position wherein said sign is in longitudinal alignment with said elongated portion and wherein said sign comprises a plurality of rigid, rectangular, foldably interconnected sections, said sign being secured in said display position by means of a combination on said sign and said standard of a protrusion and opening in

mating engagement with said protrusion, and said sign being supported on said standard through one of said sections such that when said securing means is manually disengaged, the remaining sections are foldable onto said secured section for rotation into said stored position.

4,059,916

LIGHT DIFFUSING DEVICE

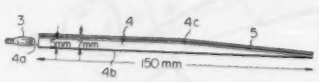
Noribumi Tachihara, Tokyo; Yukio Mizohata, Kawagoe, and Jun-ichi Makita, Tokorozawa, all of Japan, assignors to Copal Company Limited, Tokyo, Japan

Filed Jan. 26, 1976, Ser. No. 652,574

Claims priority, application Japan, Jan. 30, 1975, 50-12799; Apr. 17, 1975, 50-52177[U]; May 8, 1975, 50-62501[U]; May 22, 1975, 50-69013[U]; Sept. 9, 1975, 50-123458[U]; Sept. 11, 1975, 50-125560[U]

Int. Cl.² G09F *13/18*

U.S. Cl. 40—130 K **20 Claims**



1. In a light diffusing device for illumination purposes including a light source, a thin transparent base plate having a front illuminating surface and a rear surface with a side edge arranged adjacent to said light source, said rear surface being a roughened surface with a directional light reflecting property parallel to major side edges of said base plate, and a light reflecting plate arranged adjacent to said rear surface for permitting light from said light source to be received into said base plate and emanated from said front illuminating surface directly or after being reflected by said rear surface and said light reflecting plate so that uniform illumination is obtained over the entire area of said front illuminating surface, the light reflecting property of said roughened rear surface being determined so that, when the light is incident thereto at an angle of 75° in a plane parallel to the direction of the major side edges of said base plate, the peak of the reflecting power is in the range of 5–30% at the reflecting angle of 75° and the width of the half value is in the fange of 4°–6°, when the light is incident at an angle of 75° in a plane perpendicular to the direction of the major side edges, the peak of the reflecting power is in the range of 5–30% at the reflecting angle of 75° and the width of thehalf value is in the range of 6°–10°, said light reflecting plate having a light reflecting power substantially greater than 30% and a width of the half value of the distribution of the reflecting light greater than 90°, whereby uniform illumination prevails over the entire area of said illuminating surface by a

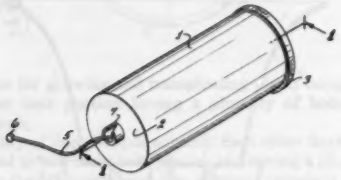
combination of the optical properties of said rear surface and said reflecting plate, said rear surface of said base plate having a plurality of small parallel grooves defined by a plurality of small parallel ridges running the direction from said side edge of said base plate adjacent to said light source to the opposite side edge, said light reflecting plate being of a light diffusing reflecting surface having an extremely low transparency and absorption.

4,059,917

SIMULATED FIRECRACKER

Larry Averett Sims, Hermosa Beach, and William John Kelley, Torrance, both of Calif., assignors to Mattel, Inc., Hawthorne, Calif.

Filed Nov. 10, 1976, Ser. No. 740,506
Int. Cl.² A63H *5/00*
U.S. Cl. 46—196 **11 Claims**



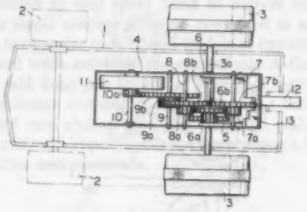
1. A firecracker which comprises:
a cylindrical tube, said tube having a first wall closing one end and an aperture through said end wall;
a resiliant cord extending through said aperture into said tube;
piston means located within said tube in sealing engagement with the inner walls thereof and adapted to travel therethrough and pressurize a portion of said tube;
helical spring means connected in between said piston and said first end wall for driving said piston means;
means coupling said cord to said piston for permitting said cord to retract said piston to a loaded position and concurrently to compress said spring;
acoustic sound generating means coupled to said piston means for generating a whistle-like sound over a predetermined interval of time upon release of said cord;
a cap-detonating means, including a base;
a detonating cap-receiving anvil means;
hammer means adapted to pivot and strike said cap-receiving anvil means for exploding any cap placed thereon;
shoulder pin means mounted to said base for pivotally mounting said hammer means for pivotal movement transverse to the axis of said tube;
torsion spring means mounted on said shoulder pin means coupled to said hammer means for driving said hammer means;
latch means for holding said hammer means in a loaded position;
latch pin means for releasing said latch means in response to a force thereon;
said base being carried at the remaining end of said tube in sealing engagement therewith;
a passage through said base;
said latch pin means extending through said passage for slidable movement therein with an end of said pin located in the path of travel of said piston means, said compression spring means having sufficient force to push said piston means into engagement with and move said latch pin means, whereby upon release of said cord a whistle-like sound is emitted for a short interval of time followed by explosion of an installed cap.

4,059,918

TOY VEHICLE

Yukimitsu Matsushiro, Tokyo, Japan, assignor to K. K. Matsushiro, Tokyo, Japan

Filed July 19, 1976, Ser. No. 706,330
Claims priority, application Japan, Aug. 1, 1975, 50-94648
Int. Cl.² A63H *29/20*
U.S. Cl. 46—209 **4 Claims**



1. A toy vehicle comprising:
at least one ground-engaging drive wheel;
a flywheel;
a gear train for connecting the drive wheel and the flywheel whereby the drive wheel can be employed to bring about rotation of the flywheel and the inertia of the flywheel when rotating can be employed to bring about rotation of the drive wheel, the gear train including a drive gear connected to the drive wheel, an idler gear in meshing engagement with the drive gear, and at least first and second additional gears;
an idler gear shaft upon which the idler gear is mounted and which is displaceable between a position in which the idler gear meshes with said first additional gear, and the drive wheel and the flywheel are connected through an even number of gears including said idler gear and said first additional gear, and a position in which the idler gear meshes with said second additional gear, and the drive wheel and the flywheel are connected through an odd number of gears including said idler gear and said second additional gear, the idler gear shaft having at least one intermediate position in which it meshes with neither the first additional gear nor the second additional gear; and
a lever coupled to the idler gear shaft and operable to displace said idler gear shaft without breaking meshing engagement of the drive gear and the idler gear, the lever having a first position in which the idler gear shaft is positioned so that the idler gear meshes with the first additional gear, a second position in which the idler gear shaft is positioned so that the idler gear meshes with neither the first additional gear nor the second additional gear and the idler gear shaft is prevented from moving to a position in which the idler gear engages the second additional gear but is free to move to a position in which the idler gear engages the first additional gear and is urged towards engagement with the first additional gear by the drive gear when the drive wheel is rotated in one sense, a third position in which the idler gear shaft is positioned so that the idler gear meshes with neither the first additional gear nor the second additional gear and the idler gear shaft is prevented from moving to a position in which the idler gear engages the first additional gear but is free to move to a position in which the idler gear engages the second additional gear and is urged towards engagement with the second additional gear by the drive gear when the drive wheel is rotated in the sense opposite to said one sense, and a fourth position in which the idler gear shaft is positioned so that the idler gear meshes with the second additional gear.

4,059,919

HEAT TREATING PARTICULATE MATERIAL

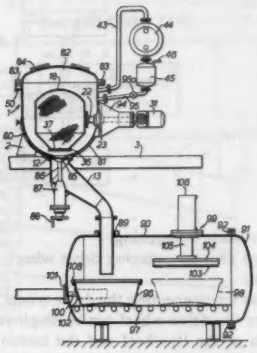
Joseph Green, Maidenhead, England, assignor to H. J. Heinz Company Limited, Middlesex, England

Filed Apr. 26, 1976, Ser. No. 680,419

Claims priority, application United Kingdom, Apr. 25, 1975, 17326/75

Int. Cl.[2] A01G *1/04*

U.S. Cl. 47—1.1 6 Claims



1. A method of heat treating particulate food or other grain material comprising:

a. supplying batch of particulate food or other grain material to be treated into an autoclave;

b. sealing the autoclave;

c. supplying water in liquid or vapour phase into the autoclave at a sufficient temperature and for a sufficient time to hydrate and sterilize the particulate material;

d. applying vacuum to the autoclave to effect flash cooling of the hydrated material;

e. agitating the material in the autoclave while it is hydrated, sterilized and flash-cooled; and

f. directly feeding the sterilized treated material from the autoclave into a sterile container under aseptic conditions.

5. A method for the hydration of grain for use in the production of mushroom spawn comprising:

a. supplying a batch of grain into an autoclave;

b. sealing the autoclave;

c. supplying water in liquid or vapour phase into the autoclave at a sufficient temperature and for a sufficient time to effect a predetermined degree of hydration and sterilization of the grain;

d. agitating the grain in the autoclave while it is hydrated and sterilized;

e. flash-cooling the hydrated grain in the autoclave while agitation continues;

f. adding a powder to the flash-cooled hydrated grain and continuing said agitation to mix the powder with the grain so that the grain is coated and separated;

g. feeding steam into the autoclave for a time sufficient to sterilize the coated grain;

h. flash cooling the sterilized grain;

i. continuing agitation of the grain in the autoclave during the sterilization and flash-cooling of steps (g) and (h);

j. removing the cooled sterile grain from the autoclave under aseptic conditions;

k. inoculating mycelium into the cooked sterile grain; and

l. then packing the inoculated grain into a sterile container which permits growth of the mycelium under incubation conditions.

4,059,920

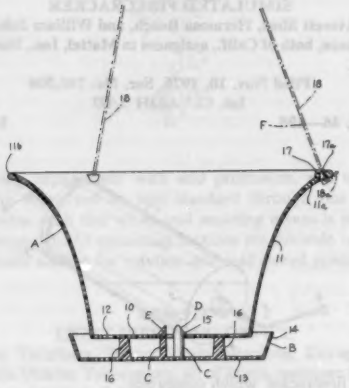
HANGING FLOWER POT ARRANGEMENT

Paul O. Worrell, P.O. Box 347, Etowah, N.C. 28729

Filed Mar. 3, 1976, Ser. No. 663,560

Int. Cl.[2] A01G *9/02*

U.S. Cl. 47—67 1 Claim



1. A hanging flower pot assembly comprising:

A. a flower pot for containing the roots of a plant having a bottom, and a surrounding side wall extending upwardly from a marginal portion of said bottom;

B. a dish carried below said bottom having a base and an upwardly extending flange carried by said base extending upwardly with an upper edge terminating substantially coplanar with said bottom;

C. a plurality of circumferentially spaced, flexible projections extending upwardly from a medial portion of said base;

D. enlarged inwardly converging cam follower portions carried by said projections having outwardly extending portions projecting beyond said projections carried adjacent an upper portion thereof in spaced relation to said base;

E. a camming portion defining an opening in the medial portion of said bottom for urging said cam follower portions inwardly so as to be received therein;

F. said outwardly extending portions having a substantially flat lower surface which rests on the bottom of said pot for supporting said dish;

G. means carried by said flower pot for suspending the entire assembly forming a hanging arrangement; and

H. a plurality of circumferentially spaced protuberances extending upwardly from said base toward said bottom when said dish is suspended from said pot, said protuberances substantially surrounding said projections and extending at lesst half the distance from said projections to the periphery of said bottom and further comprising a plurality of drain holes in said bottom positioned radially beyond said protuberances to facilitate the drainage and aeration of said soil when the water level is therebelow;

whereby water may flow from the the bottom of the flower pot into said dish providing drainage for the roots avoiding excessive soaking thereof as may cause rotting.

V 964/5 NO 29 77 UMI

4,059,921

PLANT POT FOR GROWING A PLANT

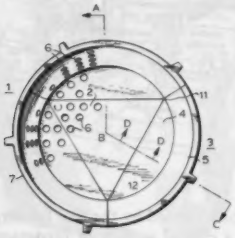
Takeshi Moriwaki, Sakai, Japan, assignor to Daicel Co., Ltd., Sakai, Japan

Filed June 18, 1976, Ser. No. 697,732

Claims priority, application Japan, June 21, 1975, 50-85978[U]

Int. Cl.² A01G 9/02

U.S. Cl. 47—73 12 Claims



1. A pot for growing and transplanting plants comprising:

an inner base portion having a plurality of holes therethrough;

a plurality of flap portions adjacent each other flexibly connected to said inner base portion and having a plurality of holes therethrough, each flap portion comprised of:

a flat outer base portion flexibly connected to said base portion and having a plurality of holes therethrough, and

a side portion projecting upward from said flat outer base portion and having a plurality of holes therethrough, and

said flexible connection permitting said flap portions to be flexed outwardly for transplanting; and

clamping means on said flap portions for holding said flap portions together in a closed position for growing said plant, said inner and outer base portions being coplanar when said pot is in said closed position.

4,059,922

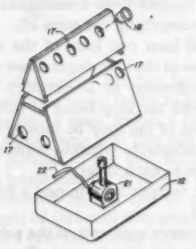
SPRAYER HYDROPONIC GROWER

Joseph A. DiGiacinto, 535 Ocean Blvd., Coronado, Calif. 92118

Filed Jan. 12, 1976, Ser. No. 648,098

Int. Cl.² A01G 25/00

U.S. Cl. 47—82 5 Claims



1. An essentially self-contained and portable hydroponic grower comprising an enclosure having a base pan for containing a liquid nutrient solution; a pair of walls projecting upward from said base pan to support a plurality of plants thereabove, said walls being inclined relative to the bottom of said pan in an A-frame configuration with the apex thereof above said base pan and having their lower ends circumscribed by said pan, each of said walls being generally planar and including a plurality of apertures extending generally normally therethrough communicating with the interior of said enclosure; a plurality of plant pots, each of which is adapted to contain a porous plant support medium and extend through an associated one of said apertures with its side wall in engagement with the peripheral edge of said aperture for said pot to be held in position thereby, the root end of each of said pots being permeable both to the flow of liquid nutrient solution to the interior thereof and to the passage of the roots of plants supported thereby outward; a liquid spray head positioned within said enclosure between said inclined walls to spray a liquid toward roots of plants projecting from the root ends of pots extending through said apertures; a liquid pump positioned within said base pan and connected to said spray head to deliver thereto under pressure a liquid nutrient solution contained in said pan; and end walls at opposite ends of said enclosure extending between said inclined walls and from the apex of said A-frame configuration to said base pan to define with said inclined walls a hollow enclosure containing said spray head and adapted to contain said root ends of said pots, said end walls being substantially moisture impermeable for maintaining a humid atmosphere within said enclosure.

4,059,923

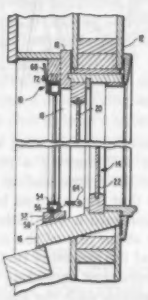
SECURITY WINDOW GUARD

Abe Sauer, 1205 Bristol Apt. 17, Memphis, Tenn. 38117

Filed Apr. 16, 1975, Ser. No. 568,494

Int. Cl.² E06B 3/68, 7/088

U.S. Cl. 49—57 3 Claims



1. In a security guard for windows having a rigid metal grid assembly mounted on the window frame and covering the window opening, the improvement wherein said security guard includes a fixed rectangular frame which extends entirely about the window frame to the exterior of the window opening, said fixed frame including generally opposed horizontal top and bottom frame members and opposed vertically extending side frame members, each of the opposed members of at least one of said opposed horizontal top and bottom frame members and said opposed vertically extending side frame members including orifice means in the inwardly directed surface thereof; a rigid open rectangular frame movably mounted in said fixed frame and including opposed top and bottom beams and opposed side beams, said rigid open rectangular frame being inset within said fixed frame with said beams thereof normally disposed in closely adjacent parallel relation to corresponding members of said fixed frame and with the exterior surface of said beams thereof non-extendant beyond the exterior surface of corresponding members of said fixed frame, each of the opposed beams of at least one of said opposed top and bottom beams and opposed side beams including keeper means, said orifice means of said fixed rectangular frame and said keeper means of said rigid open rectangular frame being provided on respectively corresponding members thereof and positioned so that said keeper means of said rigid rectangular frame cooperatively engages with said orifice means of the corresponding member of said fixed frame, said keeper means comprising key actuated blinded mortice lock means including bolt means adapted to project into said orifice

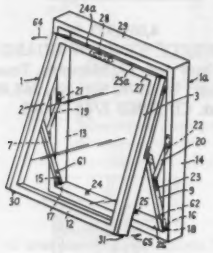
means of the member of said fixed frame corresponding to the member of said rigid open rectangular frame having the same in a manner to lock said movable frame in said fixed frame, the key receiving face of said key actuated blinded mortice lock means being positioned on the inner side of said opposed beam having the same and opening toward the window opening about which said security guard is provided; and a metal grid rigidly mounted within the opening of said movable frame and covering the window thereof in an outwardly spaced relation thereto.

4,059,924

OPERATING MECHANISM FOR DOORS AND WINDOWS

Johannes Harald Bierlich, Oresundshoj 15, Charlottenlund, Denmark

Filed July 7, 1976, Ser. No. 703,293
Int. Cl.² E05D *15/48*
U.S. Cl. 49—192 **10 Claims**



1. A window assembly comprising a window sash, a surrounding frame, the sash having a pair of secondary stiles which are hinged to the frame and to opposite sides respectively of the sash so that the sash can be tilted with said stiles from a closed position into a ventilating position and can be rotated horizontally about one of the ends of said stiles into a reversed position, and the assembly further comprising operating and locking mechanism including an operating member which in a first condition with the sash in the closed position locks the sash to the frame, in a second condition frees the sash from the frame and locks said stiles to the sash to permit tilting of the sash to the ventilating position and in a third condition with the sash in the ventilating position unlocks said stiles from said sash to permit rotation of the sash with respect to said stiles.

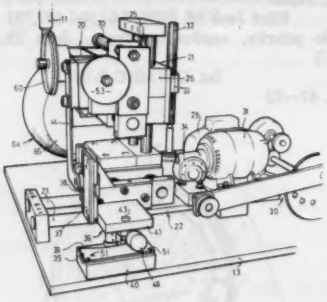
4,059,925

MACHINE FOR FORMING A CURVED SURFACE ON A WORKPIECE

Stuart Eadow-Allen, Birmingham, England, assignor to Dollond & Aitchison (Services) Limited, Birmingham, England

Filed Jan. 27, 1976, Ser. No. 652,764
Int. Cl.² B24B *13/00, 17/02*
U.S. Cl. 51—100 R **10 Claims**

1. A machine comprising:
a. a tool carrier,
b. a carriage mounted for movement relative to the tool carrier,
c. means for confining movement of the carriage to reciprocation in three manually perpendicular directions
d. a workpiece carrier secured on the carriage,
e. drive means for causing movement of the workpiece carrier in both a first of said directions and in a second of said directions said movement in at least the first of said directions being continuous reciprocation and said second of said directions being transverse to said first of said directions and
f. guide means for so constraining movement of the workpiece carrier in a third of said directions in accordance with said movement in the first and second of said directions that, when the tool carrier is moved and



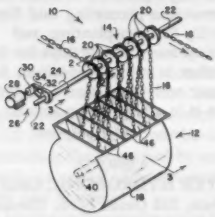
a cutting tool is carried by the tool carrier, the cutting tool describes a curved surface of predetermined form on a workpiece carried by the workpiece carrier.

4,059,926

CHAIN FINISHING SYSTEM

John F. Rampe, Mayfield Heights, Ohio, assignor to Rampe Research, Cleveland, Ohio

Filed June 16, 1976, Ser. No. 696,558
Int. Cl.² B24B *31/06*
U.S. Cl. 51—163.1 **15 Claims**



1. A method of finishing surface portions of an elongated, flexible substrate formed from a multiplicity of loosely interconnected links, comprising the steps of:
a. supporting at least one loop of the substrate such that lower portions of the loop depend into a quantity of finishing media contained in a vibratory finishing machine receptacle, with the loop being of sufficient length to let lower portions of the loop lie loosely on the bottom surface of the receptacle whereby adjacent links can move freely relative to each other;
b. vibrating the receptacle to impart a finishing action to its contents; and
c. feeding successive segments of the substrate along a path of travel defined by the loop to effect surface finishing of such segments.

4,059,927

GRINDING MACHINE

Edward G. Robillard, Cherry Valley, Mass., assignor to Cincinnati Milacron-Heald Corporation, Worcester, Mass.

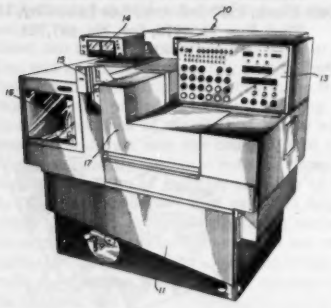
Filed Aug. 30, 1976, Ser. No. 718,900
Int. Cl.² B24B *49/10*
U.S. Cl. 51—165.77 **3 Claims**

1. A grinding machine for generating a surface of revolution on a workpiece, comprising: a. a base,

b. a workhead and a wheelhead mounted on the base for relative movement transversely of the axis of the surface of revolution,

c. a stepping motor operative to produce the said relative movement in response to receipt of electrical pulses,

d. a pulse generator connected to the stepping motor to supply the said electrical pulses, the generator including a



resistance unit connected to control the frequency of the pulses, the unit including an actuator movable in increments to connect equal increments of resistance to the generator, the said increments of resistance producing equal increments of frequency of pulses, and

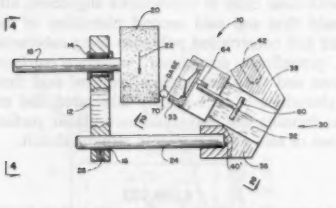
e. a circuit that reduces the pulse frequency to zero when an open circuit occurs in the resistance unit.

4,059,928

DRILL GRINDING ATTACHMENT

Raymond Marchitello, 3905 Carpenter Ave., Bronx, N.Y. 10466

Filed Oct. 12, 1976, Ser. No. 731,705
Int. Cl.² B24B *19/00*
U.S. Cl. 51—241 R **8 Claims**



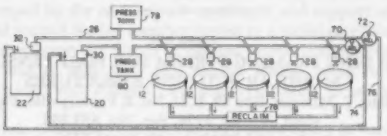
1. Apparatus for sharpening drill bits for use in a drill, said drill bit having an end with two facets to be sharpened, comprising, in combination: a main frame; a first shaft rotatably supported by said main frame near one end thereof; a second shaft substantially parallel to the first shaft and fixedly supported in said main frame near the other end thereof; a grinding wheel rotatably mounted on one end of said first shaft for sharpening said facets of said drill bits; means for rotating said grinding wheel; and a drill bit holding element mounted on one end of said second shaft for holding said drill bit therein, said holding element being positioned such that said drill bit has its facets in close proximity to the flat surface of said grinding wheel, whereby said facets are sharpened for subsequent reuse, and wherein said drill bit holding element comprises a longitudinally extending locking plate having a first end and a second end, said second end being adjacent said grinding wheel, a first arm and a second arm divergingly extending from opposite side of said first end of said locking plate, each of said first and second arms having an elongated opening formed therein for receiving said one end of said second shaft, whereby either one of said first and second arms may be attached to said second shaft for sharpening one or the other of said two facets of said drill bit, and wherein said first arm extends downwardly at an angle relative to said first end of said locking plate, and said second arm extends upwardly at an angle relative to said first end of said locking plate.

4,059,929

PRECISION METERING SYSTEM FOR THE DELIVERY OF ABRASIVE LAPPING AND POLISHING SLURRIES

David C. Bishop, Des Plaines, Ill., assignor to Chemical-Ways Corporation, Lake Bluff, Ill.

Filed May 10, 1976, Ser. No. 684,972
Int. Cl.² B24B *57/00*
U.S. Cl. 51—263 **11 Claims**



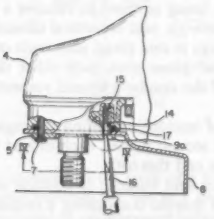
1. A system for supplying an abrasive-containing liquid to a machine for use therein which comprises, a supply of abrasive slurry concentrate containing abrasive grain which is suspended in a liquid containing sufficient emulsifying agent to suspend the abrasive grain, a supply of diluent liquid incapable of suspending the grain, a mixing chamber positioned relatively close to a desired work surface, means for separately conveying said slurry concentrate and said diluent to said mixing chamber to develop a diluted slurry concentrate in which the concentration of emulsifying agent is insufficient to suspend the grain such that at least a substantial portion of the liquid can be separated from the abrasive grain in said diluted slurry concentrate substantially immediately after use, and means for supplying said diluted slurry concentrate to said work surface.

4,059,930

REMOVABLE GUARD ARRANGEMENT FOR A POWER TOOL HAVING A ROTATING HEAD FOR PERFORMING WORK ON A WORKPIECE

Lorenzo Ercole Alessio, Lecco, Italy, assignor to The Black and Decker Manufacturing Company, Towson, Md.

Filed June 2, 1976, Ser. No. 692,217
Claims priority, application Italy, July 30, 1975, 25929/75
Int. Cl.² B24B *55/04*
U.S. Cl. 51—268 **14 Claims**



1. A removable guard arrangement for a power tool having a rotating head for rotatably driving a tool for working a workpiece comprising:

a guard member;

a mounting member fixedly attached to the tool for accommodating said guard member thereon;

means formed on said guard member and said mounting member for removably bayonet-engaging said members; and

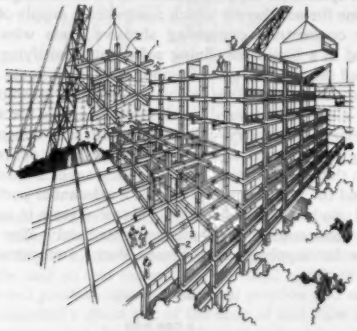
a locking mechanism including: a locking piece, resilient means for holding said locking piece in a first position against said mounting member to restrict the movement of said guard member while mounted on said mounting member, and engaging means formed on said guard member for engaging said locking piece when said locking piece is in said first position, said locking piece and said engaging means defining respective engaging surfaces extending in direction parallel to each other thereby ensuring that said guard member is held firmly on said mounting member, said locking piece being mounted so as to be movable against the force of said resilient means to a second position thereby permitting said guard member to be rotated past said locking piece so as to facilitate the bayonet removal of said guard member from the tool.

4,059,931

BUILDING FRAMING SYSTEM FOR POST-TENSIONED MODULAR BUILDING STRUCTURES

William T. Mongan, Box 69, R.D. No. 2, Factoryville, Pa. 18419

Filed Jan. 29, 1976, Ser. No. 653,398
Int. Cl.² E04B *1/348;* E04C *3/10*
U.S. Cl. 52—79.12 **5 Claims**



1. In a building system wherein an assembly of post-tensioned structural elements are utilized, said post-tensioning being accomplished after preliminary assembly of said structural elements, the combination comprising:

a. a multiple number of said structural elements, each of said elements being of precast material and comprising at least four intersecting legs extending from a common axis and lying in one plane and at least one leg extending from said axis and in a second plane vertically to said one plane, each of said legs having a tendon conduit therethrough, said conduit being adapted to receive a plurality of tendons therethrough, said structural elements being aligned so that the legs in one plane abut each other and the legs in said second plane abut each other thereby to permit alignment of the conduits in said respective one and second planes;

b. a plurality of tendons extending through said conduits in said one and second planes, each of said tendons having a button at the end thereof,

c. means to lock said tendons in position before tension has been applied thereto comprising a rotatable locking plate having a plurality of keyhole tendon and tendon button receiving apertures therein, whereby, upon rotation in one direction said tendon buttons are retained by said plate to maintain tension and upon rotation in the opposite direction said tendon buttons are released to thereby release said tension,

d. means to exert tension upon the ends of said tendons at the outermost of said legs, said means including an anchor plug in the end of each of said outermost legs, said anchor plug having apertures therein to receive said tendons, wedges adapted to engage said tendons and be retained in said apertures after tension has been applied to said tendons, and

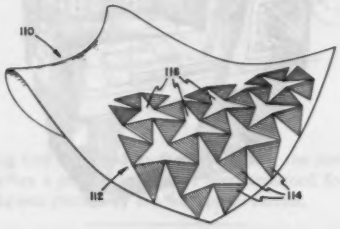
e. tension applying means in interconnection with the ends of said tendons.

4,059,932

SELF-SUPPORTING STRUCTURAL UNIT HAVING A THREE-DIMENSIONAL SURFACE

Ronald Dale Resch, 1257 2nd Ave., Salt Lake City, Utah 84103

Filed June 21, 1976, Ser. No. 697,701
Int. Cl.² E04B *1/32*
U.S. Cl. 52—81 **13 Claims**



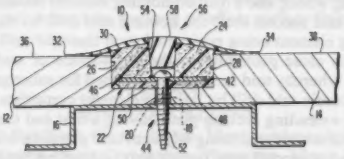
1. A self-supporting structural unit having a polygonal, non-planar surface in three dimensions approximating a smooth, predefined, non-planar, analytical surface in three dimensions, said polygonal, non-planar surface comprising: a first plurality of identical, individually fabricated and constructed planar polygons having predefined and fixed areas and equal sides of a predetermined fixed length; and a second plurality of individually fabricated and constructed substantially planar polygons having various areas with respect to themselves and equal sides of a predetermined length, the sides of said first plurality of identical, individually fabricated and constructed planar polygons being equal in length to the sides of said second plurality of individually fabricated and constructed substantially planar polygons and being secured together with their sides in coextensive alignment, all the vertices of said first and said second pluralities of individually fabricated and constructed polygons lying substantially in the smooth, predefined, non-planar, analytical surface in three dimensions and with the surface areas of said first and said second pluralities of individually fabricated and constructed polygons forming the polygonal, non-planar surface in three dimensions of said self-supporting structural unit.

4,059,933

STRIP FOR FASTENING AND SEALING SHEETS OF CONSTRUCTION MATERIAL

Richard S. Funk, Altadena; S. Alan Stewart, Rancho Palos Verdes, and David L. Ruff, Torrance, all of Calif., assignors to Grefco, Inc., Bala Cynwyd, Pa.

Filed Mar. 11, 1977, Ser. No. 776,757
Int. Cl.² E04F *19/02*
U.S. Cl. 52—127 **24 Claims**



1. An apparatus for sealingly joining two edge-abutted sheets of construction meterial and for attaching the sheets to

an underlying frame, the sheets having outwardly-facing surfaces and being oriented with the abutted edges positioned over a frame member, the abutted edges being rabbeted to form a channel along the junction of the sheets, the apparatus comprising:

a. a compressible resilient pad member for being drawn into the channel, said pad member extending in the longitudinal direction along the channel and having a transverse dimension for providing an interference fit with the sides of the channel when said pad member is drawn into the channel;

b. a resilient cap member permanently adhered to said pad member, said cap member extending longitudinally along the channel and having edges extending in the transverse direction past said pad member for contacting the outwardly-facing surfaces of the abutted sheets when said pad member is drawn into the channel, said extended edges being sufficiently flexible in both the transverse and longitudinal directions to sealingly conform to the outwardly-facing surfaces when said extended edges have been made to contact the outwardly-facing surfaces;

c. a metal strip embedded in said pad member and extending longitudinally along the channel, said strip being oriented to overlie the junction when said pad member is drawn into the channel; and

d. means for securing said metal strip to the frame member, said pad member being drawn into the channel upon activation of said securing means, the rabbeted surfaces of the sheets being captured between the portion of said pad underlying said metal strip and the frame member.

4,059,934

ARRANGEMENT FOR FASTENING AN UPSTANDING POST TO A FLOORBOARD

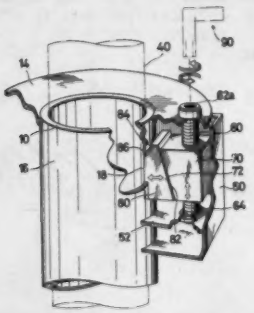
Seiji Hayamizu, Koshigaya, Japan, assignor to Senoh Kabushiki Kaisha, Tokyo, Japan

Filed Mar. 18, 1977, Ser. No. 779,233

Claims priority, application Japan, Sept. 3, 1976, 51-118448[U]

Int. Cl.[2] E02D *27/42*

U.S. Cl. 52—297 4 Claims



1. An arrangement for fastening an upstanding post in a floor board for use in indoor sports comprising:

a. a hollow cylindrical support, being provided with an opening in the circumferential wall thereof for receiving a loosely fitted post, said support being defined by a ring-shaped flange at an upper end thereof and having a truncated conically shaped projection at the bottom thereof, said support being embedded in a concrete block positioned below the floorboard at a predetermined depth,

b. a guide box, having a support plate therein, disposed on the outer circumferential wall of said cylindrical support for covering the opening in said cylindrical support,

c. a headed screw rod being rotatably supported below the head thereof by said flange whereby said head appears above said guide box, and being rotatably supported at the lower end thereof by said support plate disposed within said guide box,

d. a first wedge member, having a tapered surface at one side thereof, a screw for threadedly receiving said screw rod for upward and downward movement, said first wedge member being prevented from rotation about an axis of said screw rod by said guide box,

e. a second wedge member, having a tapered surface facing said tapered surface of said first wedge member received in the opening of said circumferential wall of said support being movable in the radial direction of said support in accordance with movement of said first wedge member,

f. step means provided at the top end of said second wedge member, said second wedge member being disposed to be stopped by the edge of said opening in said support when said second wedge member moves in a radial direction of said support to firmly press the outer circumferential surface of said post, said second wedge being further provided with a tapered surface in proximity to said step, and

g. a hole provided through the floorboard being in vertical alignment with said screw rod, whereby as means for turning said screw rod at the driving end thereof are inserted through said hole said driving end being positionable in said head of said screw rod for rotation, said first wedge member being movable in an upward and downward direction in response to rotation of said screw rod, said second wedge member being in turn movable in radial direction of said support to securely fasten the outer circumferential surface of said port in said support.

4,059,935

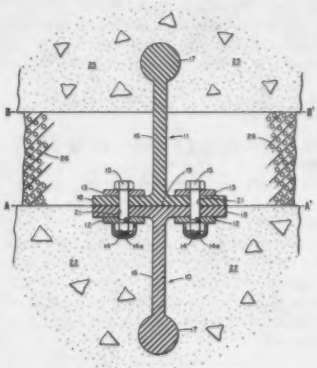
POST-APPLIED WATERSTOP

Robert W. Faid, Westford, Mass., assignor to W. R. Grace & Co., Cambridge, Mass.

Filed June 7, 1976, Ser. No. 693,507

Int. Cl.[2] E04B *1/68*; E01C *11/02*

U.S. Cl. 52—396 12 Claims



1. A waterstop member in the form of a solid strip made of resilient elastomeric material for use in a post-applied waterstop assembly employed to seal the joint between two concrete bodies, said waterstop comprising in transverse cross-section; (a) a central web to be anchored in said concrete and joined by one of its two edges to the median of (b) a crossweb, thereby forming a substantially T-shaped cross-section, the said central web (a) constituting the lower, downwardly-extending leg of said T, the said crossweb (b) constituting the upper, horizontally-extending leg of said T, said central web further in cross section having thickened areas at locations generally removed from its edge joined to said crossweb, which thickened areas resist withdrawal of said central web from said concrete; said

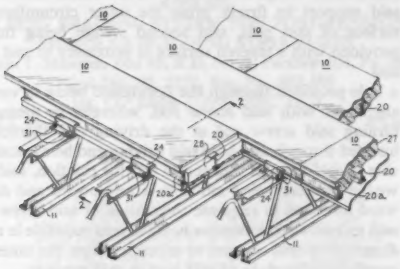
crossweb having perforations preformed therethrough along the length thereof, said perforations being regularly distributed on each side of the central web, said crossweb further having a substantially flat surface remote from its surface to which the said central web is joined for engaging in sealing relationship with another said substantially flat surface of a second like waterstop member.

4,059,936

PANEL CONSTRUCTION FOR ROOFS AND THE LIKE

Edward E. Lukens, Bethlehem, Pa., assignor to Insuldeck Corporation, Bath, Pa.

Filed Sept. 27, 1976, Ser. No. 727,170
Int. Cl.² E04B 5/52
U.S. Cl. 52—492 **14 Claims**



1. A panel of generally rectangular shape for use in building construction and for attachment to a support comprising

a first lower fire resistant gypsum board lamina,

a second lamina superposed thereon in adherent relation thereto,

said second lamina being of stabilized plastic foam and having embedded therein between the side edges a longitudinally extending steel I-beam with its lower flanges engaged with a face of the first lamina and held in engagement therewith by said second lamina,

the upper flanges of said longitudinally extending I-beam being interiorly disposed below the face of said second lamina opposite to that engaged with the face of the first lamina,

the second lamina being in covering relation to said upper flanges,

said second lamina having a tongue along one longitudinal edge thereof,

said second lamina having in secured engagement along an opposite edge face a steel I-beam having its lower flanges in the same plane as the lower flanges of the first mentioned I-beam and its upper flanges in the same plane as the upper flanges of the first mentioned I-beam and having a longitudinal edge providing a groove for the reception of an edge tongue of an adjoining panel, and

members for securing said second mentioned I-beam in place on the support.

4,059,937

STEEL GIRDER

Fritz Haller, Solothurn, Switzerland, assignor to U. Scharer Sohne AG, (USM), Munsinger, Switzerland

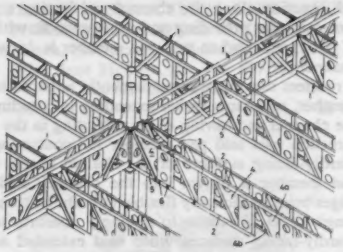
Filed May 25, 1976, Ser. No. 689,798
Claims priority, application Switzerland, May 30, 1975, 7031/75
Int. Cl.² E04C 3/04
U.S. Cl. 52—693 **2 Claims**

1. A steel girder rectangular in cross-section and having a top portion, bottom portion and opposite side portions,

four elongated parallel beams located at the respective corners of said rectangular cross-section,

pairs of spaced-apart strut elements disposed on opposite sides of said girder for connecting pairs of said beams on the top and bottom portions of said girder,

diagonally disposed H-shaped bracing elements secured within said girder and extending from the lower ends of one pair of strut elements to the upper ends of an adjacent



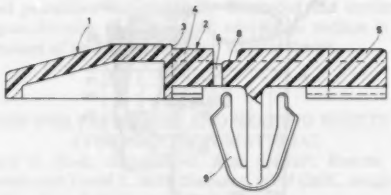
pair of strut elements, said H-shaped bracing elements having oppositely disposed open U-shaped recesses in their upper and lower ends to provide a continuous unobstructed open space in the top and bottom portions of said girder to provide ease of mounting auxiliary elongated building components within said girder.

4,059,938

ADJUSTABLE MOLDING END CAP

Michele Aimar, Turin, Italy, assignor to ITW Fastex Italia, S.p.A., Turin, Italy

Filed Sept. 10, 1976, Ser. No. 721,151
Claims priority, application Italy, Sept. 11, 1975, 27134/75
Int. Cl.² E04C 2/38
U.S. Cl. 52—716 **3 Claims**



1. A one-piece plastic adjustable end cap and retaining means adapted for mounting decorative moldings to an apertured work panel including a first portion retaining means having a substantially rigid head complementary to and adapted to be accepted within said molding in spaced relation to an end of said molding, said first portion further having stud means for anchoring said head in relatively fixed relation to said apertured panel, a second portion moveably spaced relative to said first portion and having molding engaging means for complementary acceptance within the said molding and a decorative end cap integral with and extending from said engaging means, said cap abutting the end of the molding and projecting axially therefrom, and resilient means connecting said two portions whereby relative movement is permitted between said anchored first portion and said second end cap portion.

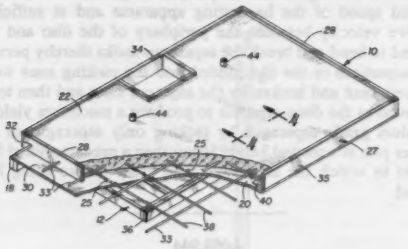
V 9 6 4 / 5 N 0 2 9 7 7 UMI

4,059,939

PREFABRICATED BUILDING UNIT

Lillard H. Elliott, Monte Vista, Colo., assignor to Elliott Enterprises of Monte Vista, Monte Vista, Colo.

Filed Aug. 30, 1976, Ser. No. 718,973
Int. Cl.[2] E04G *21/00*
U.S. Cl. 52—745 1 Claim



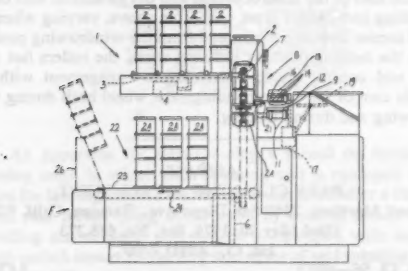
1. The method of constructing a prefabricated building unit for use with similar adjacent units, comprising:
   a. framing a stud wall against a flat horizontal surface,
   b. nailing a coating of intermediate wall on one side of said stud wall, allowing the nail heads to protrude a substantial distance from the intermediate wall,
   c. placing a frame for concrete on top of the intermediate wall,
   d. placing horizontal reinforcing bars in the frame with the ends of the bars extending through holes in the sides of the frame for joining units,
   e. pouring a concrete outer wall in the frame while the stud wall remains against the flat horizontal surface, the concrete holding the stud wall in a flat plane and preventing warpage of the studs,
   f. washing the concrete to produce an exposed aggregate finish, and
   g. raising the wall to vertical position for installation with said similar units at a building site.

4,059,940

APPARATUS FOR FILLING CONTAINERS WITH CIGARETTES OR THE LIKE

Gunter Menge; Karl-Heinz Grieben; Lutz Reitmeier, all of Hamburg, and Willi Frank, Hohnsdorf, all of Germany, assignors to Hauni-Werke Korber & Co. KG, Hamburg, Germany

Filed Mar. 30, 1976, Ser. No. 671,744
Claims priority, application Germany, Apr. 11, 1975, 2515898
Int. Cl.[2] B65B *19/04*
U.S. Cl. 53—148 19 Claims



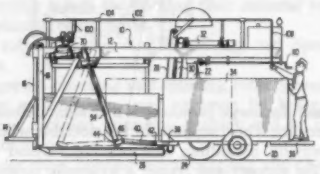
1. In an apparatus for introducing groups of cigarettes or analogous rod-shaped articles into containers, a combination comprising a group forming device; means for supplying articles to said device; conveyor means for transporting containers past said device; transfer means for moving groups of articles from said device into a container on said conveyor means, said transfer means being arranged to perform translatory movements between first and second positions and to move a group of articles from said device into a container during movement from said first position; and drive means for said transfer means, including a variable-speed prime mover having a rotary output element, a mechanical transmission having input means receiving motion from said output element and output means for imparting translatory movements to said transfer means, and control means for varying the RPM of said output element in accordance with a predetermined pattern, said control means including means for effecting the acceleration of said prime mover from zero speed at a relatively high first rate and the deceleration of said prime mover to zero speed at a relatively low second rate.

4,059,941

TRAILER HITCH FOR A TOBACCO HARVESTER

Oren M. Taylor, Highway 701 South, Elizabethtown, N.C. 28337

Filed May 7, 1976, Ser. No. 684,227
Int. Cl.[2] A01D *45/16*
U.S. Cl. 56—27.5 3 Claims



1. A tobacco harvesting combination comprising a tobacco harvester having defoliator means adapted to remove the leaves from tobacco plants as the harvester transverses a row of tobacco plants and conveyor means for depositing said leaves to one side of said harvester, a trailer having means thereon for receiving said tobacco leaves and coupling means for adjustably coupling said trailer to said harvester in operative relation to receive the leaves from said conveyor means, said coupling means comprising lever means pivotally mounted on said harvester, hydraulic means mounted on said harvester and operatively connected to said lever means for pivoting said lever means and connecting means for connecting said trailer to said lever means whereby upon operation of said hydraulic means to pivot lever means said trailer will be moved relative to said harvester and said leaves will be evenly received and distributed throughout said trailer.

4,059,942

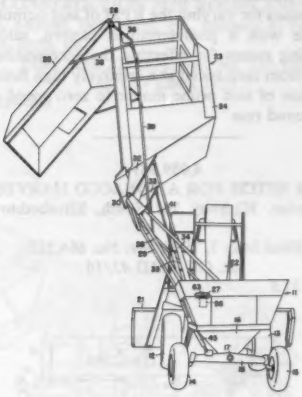
COTTON HARVESTER

David Lee Trimble, Polk City; Russell Dean Copley; James Keith Jensen, both of Ankeny, and Francis Edward Schlueter, Des Moines, all of Iowa, assignors to Deere & Company, Moline, Ill.

Filed July 18, 1975, Ser. No. 597,102
Int. Cl.[2] A01D *46/08*
U.S. Cl. 56—30 8 Claims

1. In a cotton harvesting implement having a main frame carried on a pair of transversely spaced traction wheels at its forward end and a pair of transversely spaced steerable wheels at its other end, with the former wheels being mounted on the frame by a transversely elongated wheel support rigid with the frame, and the latter wheels being mounted on the frame by a transversely elongated rigid wheel support pivotally mounted at its center on the frame on a fore-and-aft extending horizontal axis, harvesting devices supported on the frame forward of the front traction wheels and having a transverse expanse greater

than the transverse expanse of the wheels; structure on the frame defining a fore-and-aft extending pivot above and outboard of the wheels, and a cotton receptacle supported on the frame above the front and rear wheels and shiftable about the pivot defined by the structure between an inboard position in which the receptacle is generally inboard of the pivot and above the wheels and a discharge position in which the receptacle is over the pivot and a large portion thereof is outboard of the pivot; power means for shifting the receptacle between



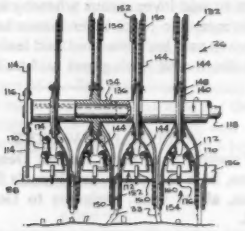
inboard and discharge positions; a hydraulic cylinder extending between the wheel support for the steerable wheels and the frame normally permitting free relative vertical movement between the support and frame; a hydraulic control for said cylinder actuated upon the power means shifting the receptacle toward said discharge position to lock the cylinder againt extension or retraction and upon returning the receptacle to its inboard position making the cylinder freely extensible and retractable.

4,059,943

HARVESTER APPARATUS

Gerald J. Peasley, R.R. No. 1, Eilers Road, Montaque, Mich. 49437

Filed May 28, 1975, Ser. No. 581,632
Int. Cl.² A01D *45/00*
U.S. Cl. 56—327 A **17 Claims**



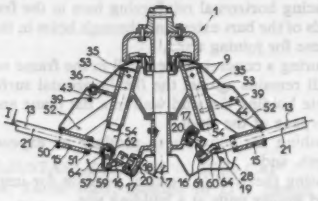
1. A harvesting apparatus adapted for traveling along an asparagus bed and picking asparagus stalks, said apparatus comprising a support frame, ground engaging means mounted to the frame for maintaining the support frame at a predetermined distance above the ground, and picking means mounted on the support frame for grasping only the stalks of a predetermined first height above the ground and bending the stalks of the asparagus to break the stalks at a second height above the ground which is less than the predetermined first height and at which the stalk is of a predetermined desired pith, said picking means including a rotary driven shaft mounted on the support frame perpendicular to the direction of travel of the harvesting apparatus and parallel to the ground, pairs of parallel flexible discs fixed to the rotary shaft and having protrusions on at least one of the radial surfaces of each disc, spacing means for bringing pairs of adjacent discs into close proximity during rotation of the discs through a picking zone, means for separating the discs after the discs rotate out of the picking zone and drive means for rotating the discs at peripheral speeds other than the ground speed of the harvesting apparatus and at sufficient relative velocity between the periphery of the disc and the ground to bend and break the asparagus stalks thereby permitting asparagus or the like guided into the picking zone to be grasped, bent and broken by the adjacent discs and then to be removed as the discs separate to produce a macimum yield of premium grade asparagus by picking only asparagus of the proper pith at a second height lower than a predetermined first height to which the asparagus must grow before being harvested.

4,059,944

HAYMAKING MACHINE FOR THE TEDDING AND WINDROWING OF FODDER

Walter Reber, Saverne, France, assignor to Kuhn, S.A., Saverne, France

Filed May 4, 1976, Ser. No. 683,032
Claims priority, application France, May 5, 1975, 75.14257; Oct. 28, 1975, 75.33490
Int. Cl.² A01D *79/00*
U.S. Cl. 56—370 **22 Claims**



1. In a haymaking machine for the tedding and windrowing of fodder, comprising at least one rake wheel driven in rotation on which working tool-carrier arms are mounted for pivoting in support bearings and possess at their ends facing the rotation axis of the corresponding rake wheel a control crank provided with a roller which moves in a guide cam so as to cause the working tools to pivot, over a portion of their path of revolution, upwards and in the direction opposite to the direction of rotation of the corresponding rake wheel during windrowing; the improvement in which the control cranks provided with rollers are connected with the working tool-carrier arms by means of an articulation, the angle formed between the geometric axes of the control cranks and the geometric axes of the working tool-carrier arms, seen from above, varying when the said carrier arms are transposed from the windrowing position into the tedding position and vice versa, the rollers fast with the said control cranks remaining in engagement with the guide cam of the corresponding rake wheel both during windrowing and during tedding.

4,059,945

RAKE CLEANING ATTACHMENT

Robert Martinez, 2340 San Diego Ave., Ramona, Calif. 92065

Filed May 20, 1976, Ser. No. 688,273
Int. Cl.² A01D *7/00*
U.S. Cl. 56—400.1 **3 Claims**

1. In combination with a rake having an elongated handle and a series of spaced tines projecting from a common base element at one end of said handle, support member secured to said handle near said one end, an ejector member pivoted at one end on said support member and formed at the other end

with a series of tine cleaning projections extending through the spaces between adjacent tines, said ejector member being movable between a normal retracted position where said projections are disposed at the bases of said tines and an extended position where said projections are disposed at the tips of said tines, a manual pull member longitudinally slidably mounted on said handle for movement generally parallel to said handle,

an actuating rod pivotally connected at opposite ends to said ejector member and said pull member, resilient means on said handle connected to said actuating rod for biasing said rod to dispose said ejector member in retracted position, and means on said handle coacting with said pull member providing a limiting stop to prevent said ejector member from being displaced beyond the tips of said tines in said extended position.

4,059,946

METHOD AND APPARATUS FOR START-SPINNING A THREAD ON OPEN-END SPINNING UNITS

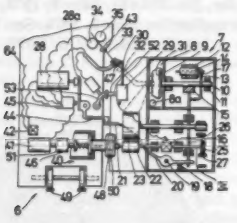
Dieter Böttcher, Bad Uberkingen; Heinz Schulz, Donzdorf, and Fritz Stahlecker, Bad Uberkingen, all of Germany, assignors to Fritz Stahlecker and Hans Stahlecker, both of, Germany

Filed Dec. 2, 1975, Ser. No. 637,050

Claims priority, application Germany, Dec. 7, 1974, 2458042

Int. Cl.² D01H *15/00*

U.S. Cl. 57—34 R **27 Claims**



3. An apparatus for start-spinning a thread on open-end spinning units, in which each spinning unit is equipped with means for feeding a sliver which are switched off after a thread break, said means being acted upon by control means of a travelling maintenance unit, which is equipped with means which switch means for feeding said sliver of said spinning unit on and/or off,

in which the maintenance unit is divided into two independently travelling partial units, one containing the means for switching the sliver feed on and off for a given period of time and the other containing means for performing the actual start-spinning operation.

4,059,947

OPEN-END SPINNING UNIT

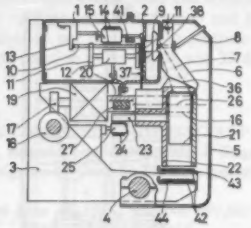
Gerd Stahlecker, Bad Uberkingen, Germany, assignor to Fritz Stahlecker and Hans Stahlecker, both of, Germany

Filed Oct. 17, 1975, Ser. No. 623,474

Claims priority, application Germany, Oct. 30, 1974, 2451551

Int. Cl.² D01H *1/12*

U.S. Cl. 57—58.89 **26 Claims**



1. An open-end spinning unit comprising:

spinning rotor means for spinning fiber material supplied thereto,

opener roller means for opening fiber material supplied to the spinning rotor means,

opener roller drive means for driving said opener roller means,

a common lid covering said spinning rotor means and said opener roller means, said common lid being movable between a closed operating position and an open non-operating position,

and opener roller housing means carrying said opener roller means, said opener roller housing means being movable with respect to said spinning rotor means between a driving position with said opener roller means in driving engagement with said opener roller drive means and a non-driving position with said opener roller means out of driving engagement with said opener roller drive means,

said common lid being operable to hold said opener roller housing means in said driving position when said common lid is in said closed operating position.

4,059,948

AUTOMATIC THREADING FALSE-TWIST SPINDLE

Yves C. Derail, La Murette-Ambierle, and Jean-Claude Dupeuble, Roanne, both of France, assignors to ASA S.A., Roanne, France and Societa Nazionale Industria Applicazioni Viscosa S.p.A., Milan, Italy

Filed May 21, 1976, Ser. No. 688,791

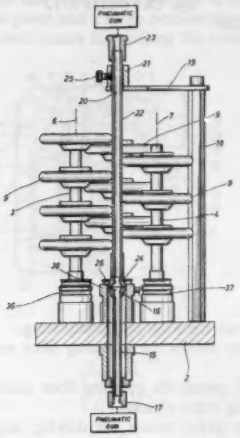
Claims priority, application France, May 23, 1975, 75.16736

Int. Cl.² D01H *7/92*

U.S. Cl. 57—77.33 **14 Claims**

8. In a false twist texturing spindle unit of the type having at least three driven parallel axles symmetrically disposed about a median axis defining the central axis of the spindle, each said axle being provided with at least one rotationally symmetric frictional twisting disc whereby said discs overlap said central axis in an operative mode to supply twists to the yarns passing therealong and said axles being outwardly movable in a threading mode and said unit having means for supplying yarn to the spindle area and means for taking up yarn after the false twist operation, the improvement comprising a first fixed guide tube colinear with said central axis and providing a tubular path for introducing yarn into the spindle unit and terminating in a mouth portion proximate one end of said discs, a second linearly retractable guide tube colinear with said central axis and having a length at least as long as the portion of said axles incorporating said discs and being selectably positionable in either a retracted operating position wherein the yarn passes through the retractable tube after engagement with said discs or in a threading position wherein the terminal end portion of

the retractable tube is moved into communication with the mouth of said fixed tube for establishing a substantially uninterrupted tubular path along the central axis of the unit, and means for propelling yarn through said first and second tubes during the threading mode.



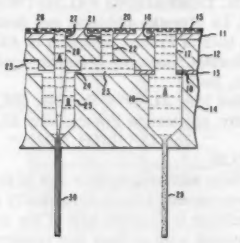
10. A spindle unit as claimed in claim 8 wherein said means for propelling comprises pneumatic gun means for moving the yarn through said first and second tubes.

4,059,949

SHEATH-CORE COSPUN HEATHER YARNS

Lin-Fa Lee, Chattanooga, Tenn., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Division of Ser. No. 442,905, Feb. 15, 1974, Pat. No. 3,992,499.
This application Sept. 2, 1976, Ser. No. 719,954
Int. Cl.[2] D02G *3/04*
U.S. Cl. 57—140 BY 16 Claims



12. A yarn exhibiting differential dyeing capability consisting essentially of two groups of filaments which are comprised of two different thermoplastic, melt-spinnable, fiber-forming polymers selected from the group consisting of poly(ethylene terephthalate) and poly[ethylene terephthalate/5-(sodium-sulfo)isophthalate], said polymer compositions having substantially different receptivities for a first class of dyes and a common receptivity for a second class of dyes, wherein a first group of filaments consists of homofilaments of one of said polymers and the second group of filaments consists of substantially concentric, sheath-core filaments, the sheath being comprised of the other of said two polymers and the core being comprised of the same polymer as the homofilaments.

4,059,950

MULTIFILAMENT YARN HAVING NOVEL CONFIGURATION AND A METHOD FOR PRODUCING THE SAME

Takao Negishi, and Kazuo Tomiita, both of Otsu, Japan, assignors to Toray Industries, Inc., Tokyo, Japan

Filed Dec. 11, 1975, Ser. No. 639,873
Int. Cl.[2] D02G *1/02, 3/34*
U.S. Cl. 57—140 J 9 Claims

1. A polyester yarn composed of a plurality of individual fibrous materials, each of said fibrous materials provided with thicker cross-sectional portions, thinner cross-sectional portions and intermediate thickness-size portions randomly distributed along the axial direction thereof, said by the following four conditions,

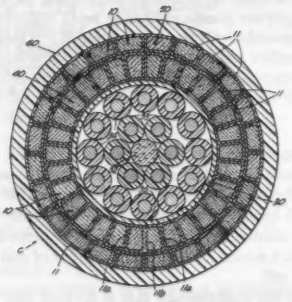
a. a distribution curve of the cross-sectional area of said individual fibrous materials is deviated to the thinner side,
b. the degree of variability, V/S, of said cross-sectional area of said individual fibrous materials, where V is the standard deviation and S is the mean value, is in a range between 7% and 30%,
c. in the distribution of the cross-sectional areas of said fibrous materials, if the range of distribution is divided in such a way that the distribution range in the thicker side from the average value is divided by a width corresponding to $\frac{1}{4}$ of the standard deviation thereof, the distribution frequency in any class defined by the above-mentioned method of division is less than three times the distribution frequency in a class adjacent to said specific class in the thinner side of the distribution.
d. the standard deviation of the average cross-sectional area of individual fibrous materials in optional cross sections of said multifilament yarn is smaller than the quotient of the standard deviation of said fibrous materials divided by the one-fourth power of the average number of said fibrous materials constituting said optional cross sections of said multifilament yarn.

4,059,951

COMPOSITE STRAIN MEMBER FOR USE IN ELECTROMECHANICAL CABLE

Norman P. Roe, Idyllwild, Calif., assignor to Consolidated Products Corporation, Idyllwild, Calif.

Division of Ser. No. 574,611, May 5, 1975, Pat. No. 3,973,385.
This application May 3, 1976, Ser. No. 682,329
Int. Cl.[2] H01B *7/18;* D07B *1/16*
U.S. Cl. 57—149 5 Claims



1. In an electromechanical cable, a composite strain member comprising:

a plurality of fibers having high tensile strength and slick surfaces disposed in adjacent parallel relationship to form a bundle; and

a jacket of plastic material enclosing said bundle;

the cross-sectional configuration of said composite member being easily deformable, and said jacket serving to confine said fibers in a predetermined lateral position while said fibers may slide longitudinally relative to each other and within said jacket as required by mechanical movements of the cable.

4,059,952

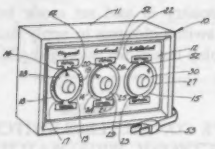
BIO-RHYTHM CALCULATOR

Erwin Kaestner, 8125 Brill Road, Cincinnati, Ohio 45243

Filed May 27, 1976, Ser. No. 690,515

Int. Cl.[2] G04B *19/24, 19/30, 19/06;* G06C *27/00*

U.S. Cl. 58—4 R 2 Claims



1. A Bio-Rhythm calculator comprising:

a. a display panel having a first circular dial face comprising a first locus of points, a second circular dial face comprising a second locus of points and a third circular dial face comprising a third locus of points, said first, second and third loci of points corresponding, respectively, to an individual's physical, emotional and intellectual Bio-Rhythm cycles, and each marked to exhibit a pair of relatively narrow diametrically opposed arcs disposed along the periphery of each of said dial faces and incorporating those points defining the critical phase of the corresponding Bio-Rhythm cycle;

b. first, second and third pointing members rotatably associated, respectively, with said first, second and third dial faces, each of said pointing members being operable for scanning its corresponding dial face for identifying the points in its associated locus of points, each of said pointing members being independently presettable to identify any point in its associated locus of points, said first, second and third pointing members comprising, respectively, a first knob having a first circular skirt depending therefrom, said first circular skirt having indicia dividing the periphery thereof into 23 equal sections and having indicia thereon overlying one of said dividing indicia for pointing toward the periphery of said first dial face, a second knob having a second circular skirt depending therefrom, said second circular skirt having indicia dividing the periphery thereof into 28 equal sections and having indicia thereon overlying one of said dividing indicia for pointing toward the periphery of said second dial face, and a third knob having a third circular skirt depending therefrom, said third circular skirt having indicia dividing the periphery thereof into 33 equal sections and having indicia thereon overlying one of said dividing indicia pointing toward the periphery of said third dial face; and

c. means for operating said first, second and third pointing members for sequentially scanning all points in said first, second and third loci of points in, respectively, 23, 28 and 33 days, said indicating means comprising means for rotatably advancing each of said circular skirts and its associated knob one division per day relative to its associated dial face, said means for rotatably advancing including a prime mover having an output shaft bearing a driver gear, a first idler gear meshing with said driver gear, first and second control gears meshing with said first idler gear and having control shafts connected respectively for rotating said first knob and circular skirt and said second knob and circular skirt relative to said first and second circular dial faces, a second idler gear meshing with said second control gear and a third control gear meshing with said second idler gear and having a control shaft connected for rotating said third knob and circular skirt and relative to said third circular dial face, the speed of said motor and the gear ratios of said driver, idler and control gears being selected for rotating said first, second and third circular skirts one division per day so as to perform respectively one complete rotation every 23, 28 and 33 days.

4,059,953

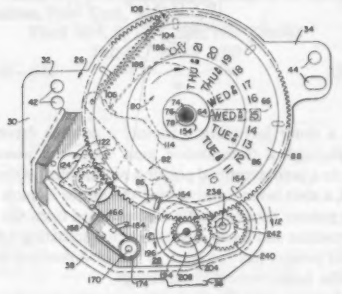
TIMEPIECE CALENDAR INDEXING APPARATUS

David Morrison, Atlanta, Ga., and Donald J. Rogers, Huntersville, N.C., assignors to General Time Corporation, Thomaston, Conn.

Filed June 18, 1976, Ser. No. 697,682

Int. Cl.[2] G04B *19/24*

U.S. Cl. 58—4 R 24 Claims



1. Apparatus for rapidly changing calendar information displayed in a timepiece, comprising:

a. support means;

b. means carried by said support means having an aperture for viewing said calender information;

c. first calendar means including

1. a first surface area of annular outline,

2. a second surface area disposed radially inwardly of said first surface area, and

3. alpha indicia representative of each of the days of the week in ordered sequence and wherein said alpha indicia is presented in substantial duplicate with each presentation including means thereby indicative of one twelve hour period as distinguished from an adjacent presentation which is indicative of another twelve hour period, said alpha indicia disposed in one of said surface areas at equiangular positions about an axis of rotation of said first calendar means;

d. means for mounting said first calender means on said support means for movement about said axis relative to said support means;

e. second calendar means having numeric indicia in ascending order from 1 to 31, said numeric indicia disposed on said calendar means at equiangular positions about said axis;

f. means on said first calendar means for mounting said second calender means whereby said calendar means are adapted for independent movement about said axis; and

g. means carried by said support means for moving rotationally each of said calendar means through substantially instantaneous advance under control of said timepiece at the end of each second 12-hour period and said first calendar means through substantially instantaneous advance at

the end of intermediate 12-hour periods, said first calendar means controlling said advance of said second calendar means.

4,059,954

LABORATORY CLOCK

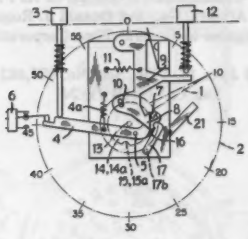
Wilhelm Grosse-Plankermann, Unterhaching, Germany, assignor to Hauck GmbH, Germany

Filed May 25, 1976, Ser. No. 689,825

Claims priority, application Germany, Jan. 13, 1976, 7600670[U]

Int. Cl.² G04B *13/00*

U.S. Cl. 58—21.13 **18 Claims**



1. In a timer including a motor, a pointer driven by the motor through a transmission gear train, the pointer being settable to a predetermined position representing a desired time interval, a start lever for actuating the motor in such a manner that the pointer runs toward a zero position from the predetermined position and a trip mechanism for actuating a stop lever when the pointer has run back to the zero position to stop the motor, the improvement comprising:

switch means for selectively changing the direction of travel of the pointer through the gear train so that the pointer runs away from the zero position, the switch means being coupled to the trip mechanism to prevent the actuation of the stop lever by the trip mechanism when the pointer runs away from the zero position; and means for manually actuating the stop lever so that the motor can be stopped when the pointer runs away from the zero position, whereby the timer is operable as a stop watch.

4,059,955

ONE BUTTON DIGITAL WATCH AND METHOD OF SETTING THE DISPLAY

Jan Willem L. Prak, Sunnyvale, Calif., assignor to Intersil, Inc., Cupertino, Calif.

Filed Nov. 12, 1975, Ser. No. 631,120

Int. Cl.² G04B *19/30*; G04C *3/00*

U.S. Cl. 58—23 R **8 Claims**

1. A single button digital watch display system for an electronic watch that generates a plurality of time varying functions for display as digits by display means on a watch face comprising:

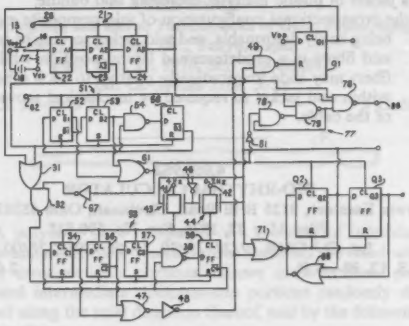
a single button on said watch being manually movable between a normal extended position and a depressed position,

a normally open switch in said watch operable to close in the depressed position of said button,

a power supply in said watch,

logic circuitry in said watch and connected by said switch to said power supply whereby switch closure applies an input signal to the logic circuitry,

said logic circuitry being responsive to input signals of different total duration in a predetermined time period to establish different display modes of said display means and a set mode of operation of said display means, and



said logic circuitry in said set mode being responsive to successive switch closures to apply successive set signals to said display means for adding digits to the display.

4,059,956

TOUCH TYPE CONTACTLESS SWITCH STRUCTURE FOR ELECTRONIC WRISTWATCHES HAVING INSULATIVE MEMBER PRECLUDING ESTABLISHMENT OF SHUNT PATH BY FOREIGN MATTER

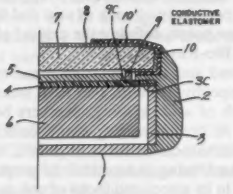
Hidetoshi Maeda, Tenri, and Takehiko Sasaki, Yamatokoriyama, both of Japan, assignors to Sharp Kabushiki Kaisha, Osaka, Japan

Filed Jan. 7, 1976, Ser. No. 647,154

Claims priority, application Japan, Jan. 10, 1975, 50-6567[U]

Int. Cl.² G04B *19/30*; H01H *35/00*

U.S. Cl. 58—23 R **4 Claims**



1. In an electronic wristwatch including an enclosure, a viewing window and movements accommodated within the interior of the enclosure, a touch type contactless switch structure operated by the wearer of the watch comprising:

a film of transparent electrode disposed on the viewing window for engagement with a portion of the body of the wearer, said electrode film serving as one electrode of said contactless switch structure;

said enclosure being engageable with the wrist of the wearer and made of electrically conductive material for serving as another electrode of said contactless switch structure;

an insulating member provided between the electrode film and the enclosure for establishing electrical isolation therebetween; and

an extension provided at the one end of the insulating member in a position to overlay the electrode film and thus the viewing window in an amount sufficient to preclude establishment of a shunt path between said electrodes by the accumulation of foreign material on said insulating member.

2. A touch type contactless switch structure as defined in claim 1 wherein the electrode film and the enclosure are con-

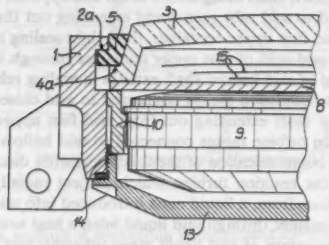
nected to a C-MOS switching circuit disposed within said enclosure.

4,059,957

WATER-TIGHT FITTING OF A GLASS IN A WATCH CASE

Ferjeux Jean Pierre Monnet, Dampricharď, France, assignor to S.B.B.M. Burdet S.A., France

Filed Apr. 20, 1976, Ser. No. 678,662
Claims priority, application France, May 23, 1975, 75.16208
Int. Cl.² G04B 37/08, 39/00
U.S. Cl. 58—90 R 6 Claims



1. A watch case, comprising;

A middle-bezel having, as an integral part thereof, an inwardly-directed collar defining a non-circular upper opening, the collar having a generally flat lower collar face;

a watch glass receivable in the non-circular upper opening, being of a corresponding non-circular shape, and having an outwardly-directed peripheral glass flange dimensioned to pass with slight play through the non-circular upper opening in the middle-bezel;

a packing seal having an outer part disposed under the collar and an inner part on and coextensive with the glass flange; and

means for applying pressure to the glass to compress the seal between the collar and the glass flange,

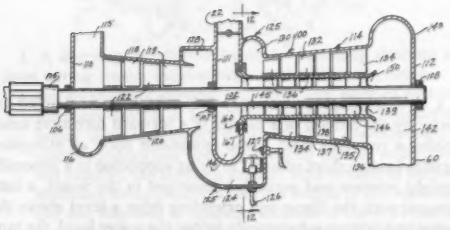
whereby the glass can be inserted in the middle-bezel through the upper opening, and can be held in the upper opening by the compressing of the seal.

4,059,958

AUTOMOTIVE ENGINE EXHAUST — CLEAN AIR SYSTEM

Florian Heklowski, and William Nicholas, both of Chicago, Ill., assignors to Florian Heklowski, Chicago, Ill.

Continuation-in-part of Ser. No. 442,928, Feb. 15, 1974, abandoned. This application Mar. 22, 1976, Ser. No. 669,095
Int. Cl.² F02G 3/00; F01N 5/04
U.S. Cl. 60—614 10 Claims



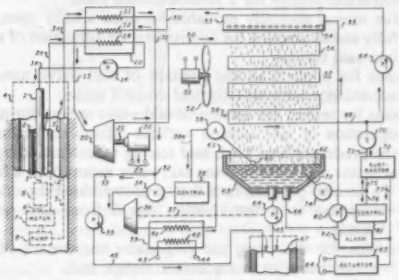
1. An internal Combustion engine having a combustion chamber and exhaust ports in communication therewith for discharging exhaust gasses — the improvement comprising: a turbine having a housing with intercommunicating chambers including a front compression chamber, an aft burner chamber and an intermediate mixing chamber, means for compressing air in the compression chamber, means for delivering the compressed air to the mixing chamber, means for supplying a combustible gas mixture into said mixing chamber, means for igniting said combustible gas mixture in the mixing chamber, means for conducting the ignited gasses into the burner chamber, heat-transfer conduit means providing passage means for the exhaust gasses through said burner chamber isolated from the ignited gasses in the burner chamber for heating said exhaust gasses for substantial consumption of the exhaust gasses in the conduit means, and means for exhausting the spent gasses from said burner chamber and said passage means, said burner means completely enshrouding said conduit means and providing an enveloping thermal shield therefor.

4,059,959

GEOTHERMAL ENERGY PROCESSING SYSTEM WITH IMPROVED HEAT REJECTION

Hugh B. Matthews, Boylston, Mass., assignor to Sperry Rand Corporation, New York, N.Y.

Filed Nov. 5, 1976, Ser. No. 739,382
Int. Cl.² F03G 7/00
U.S. Cl. 60—641 15 Claims



1. Geothermal deep well energy extraction apparatus of the kind in which solute-bearing water is pumped to a station at the earth's surface utilizing thermal energy extracted within said well from said solute-bearing water for operating turbine-motor driven electrical generator means at said station, a major portion of said solute-bearing water being returned from said station into reinjection well means, said extraction apparatus further including:

coupling means for supplying a working fluid utilizing a portion of said extracted thermal energy to an input of said turbine motor means,

condenser conduit means coupled to the output of said turbine motor means for condensing said working fluid and returning said condensed working fluid to said coupling means,

manifold distributor means for enveloping said condenser conduit means in a coolant shower in droplet form,

wet well tank means for collecting said coolant shower after cooling said condenser conduit means,

air circulating means for cooling said droplets of said coolant shower while descending from said manifold distributor means to said wet well tank means,

first pump means for conveying coolant from said wet well tank means to said manifold distributor means, and

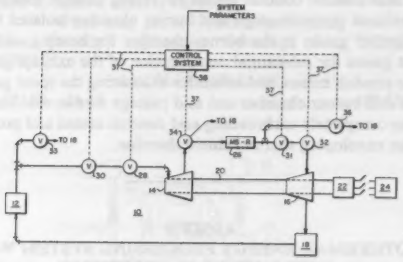
control means for selecting a minor portion of said solute-bearing water before said major portion is returned to said reinjection well means for maintaining a predetermined liquid level within said wet tank means.

V 964/5 N029 77 UMI

4,059,960
METHOD AND APPARATUS FOR TESTING THE MOVABILITY OF VALVE PLUGS

Robert L. Osborne, Wallingford, Pa., assignor to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed Mar. 11, 1976, Ser. No. 665,821
Int. Cl.[2] F01K *13/00*
U.S. Cl. 60—646 14 Claims

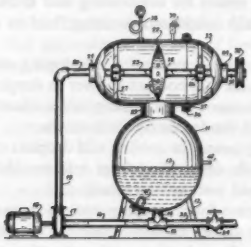


1. A steam turbine power plant comprising:
a turbine;
steam generating means for supplying steam to said turbine;
an electrical generator driven by said turbine to generate electrical energy for a predetermined load;
valve means normally movable between a fully open to a fully seated position for controlling the admission of steam into said turbine;
means for controlling the position of said valve means in accordance with an electrical control signal;
means for testing the motion of said valve means during the operation of said turbine without effectively disturbing the predetermined load, said testing means including
actuator means for moving said valve means from a first to a second position in a first predetermined direction in response to a testinitiation signal from said control means,
means for detecting the responsive movement of said valve means to said actuator means, and,
means responsive to said detecting means for indicating that the responsive movement of said valve means has occurred.

4,059,961
THERMAL MOTOR OF ACTION AND REACTION FORCES

Rodolfo de la Parra M., Isabel 1a Catolica No. 1055, Mexico 13, D.F., Mexico

Filed Sept. 13, 1976, Ser. No. 723,007
Claims priority, application Mexico, Dec. 10, 1975, 162457
Int. Cl.[2] F01K *21/00*
U.S. Cl. 60—670 10 Claims

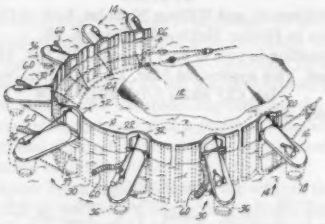


1. A thermal engine which comprises a first closed upper container having a lower orifice; a second closed lower container having an upper orifice and an inlet for liquid and a discharge for liquid, a neck member connecting the orifices of first and second containers, thus making up a double closed container with communication through said neck, a pump means having inlet and outlet, a driving means for said pump, a tube means which connects said discharge of said lower container to said inlet of said pump means, bearing means supported on the inside of said upper container, a hollow shaft rotatably supported in said bearing means, a tube means connecting outlet of said pump to said hollow shaft, fluid-tight hermetic sealing means installed integral with wall of said first upper container, by means of which the said connection between said tube means and said hollow rotating shaft is effected, said hollow shaft being closed at the end opposite to the end connected to said tube means and extending out through the wall of said first upper container, fluid-tight sealing means integral with said wall of first upper container through which the closed end of said hollow shaft extends in sealing relationship, power transmission means connected to said closed end of said hollow shaft extending out from said first upper container, reaction turbine means connected to said hollow shaft with internal communication of the fluid therewith, discharge means from the reaction turbine which project radially and tangentially therefrom, a liquid mass introduced into said second lower container through said liquid inlet, a heat source to raise the temperature of said liquid mass; whereby said liquid mass when heated is driven by said pump through said tube means and said hollow rotary shaft to said reaction turbine, said hot liquid mass being discharged therefrom and converted into saturated vapor which is subsequently condensed, there being constant pressure and constant temperature inside said containers in presence of its liquid in the closed system.

4,059,962
FLOATING SKIMMING BARRIER ASSEMBLIES

Jerome H. Milgram, 23 Mellen St., Cambridge, Mass. 02138

Filed Oct. 8, 1976, Ser. No. 730,811
Int. Cl.[2] E02B *15/04*
U.S. Cl. 61—1 F 7 Claims

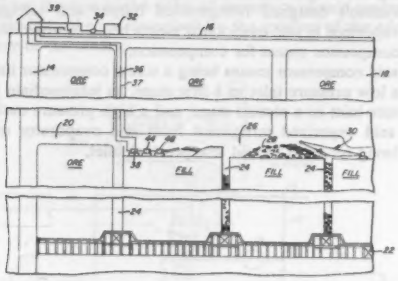


1. A skimming sub-assembly for collecting oil floating on water by the motion of a barrier in a forward direction, comprising a two part rigid frame mountable upon an elongated flexible barrier sheet adapted to being supported in a generally upright position and partially submerged in the water, a tank integral with the frame and extending from a level above the water to a bottom substantially below the water level, the tank having an inlet opening near the water level and a conduit extending between the bottom of the tank and an outlet connectible to a suction hose at the water surface.

4,059,963
METHOD OF MINE BACKFILLING AND MATERIAL THEREFOR

William Ross Wayment, Kitchener, Canada, assignor to Joy Manufacturing Company, Pittsburgh, Pa.

Filed Aug. 19, 1976, Ser. No. 716,017
Int. Cl.[2] E02D 3/12; E21C 37/00, 41/00, 45/00
U.S. Cl. 61—35 8 Claims

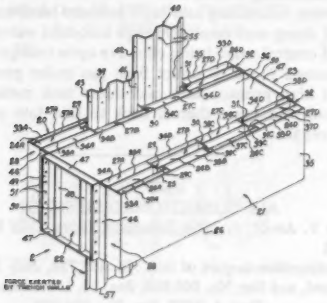


1. A method of backfilling underground cavities and the like comprising: transporting a slurry of mill tailings and water through a closed conduit system to an underground location, dewatering said slurry at said location as said slurry is received thereat to produce a material of a consistency that said material stabilizes as substantially an unsupported mass without removing water therefrom by auxiliary means, and placing said material in a cavity or the like to be filled.

4,059,964
SHEETING INSTALLATION SYSTEM

John R. Pavese, 761 Cathy Ann Court, Paramus, N.J. 07652

Continuation-in-part of Ser. No. 566,079, April 8, 1975, abandoned. This application Sept. 3, 1976, Ser. No. 720,138
Int. Cl.[2] E21D 5/12
U.S. Cl. 61—41 A 9 Claims



1. A sheeting installation frame for installing sheeting sections during trench excavations and the like comprising

a pair of sheeting support wall members, each of said wall members having at least two substantially vertically-disposed sheeting support slots extending therethrough for slidably supporting sheeting sections therein with cantilever support, the sheeting support slots of each of said wall members being located along the length of the wall member and disposed in modular sections of the wall member defined by a series of substantially vertically-disposed and spaced apart end plates having laterally-extending edge portions, the end plates between abutting modular sections being stepped plates having longitudinally-extending central portions joining the edge portions thereof to separate the support slots of the abutting modular sections, so that the support slots of abutting modular sections are disposed on opposite sides of the end plate central portions in overlapping relationship, whereby sheeting sections disposed in said slots are overlapped;

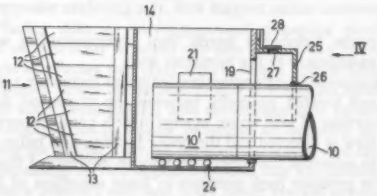
a pair of spreader members disposed between said wall members adjacent opposite ends thereof for separating said wall member slots the distance between sheeting sections to be installed on opposite trench sides; and

means for removably connecting said spreader members to said wall members to form a frame which resists the lateral forces exerted by said trench sides on the sheeting sections in said slots.

4,059,965
APPARATUS FOR AND A METHOD OF LAYING A PIPE LINE

Dieter Stuckmann, Selm, Germany, assignor to Gewerkschaft Eisenhutte Westfalia, Wethmar near Lunen, Germany

Filed May 17, 1976, Ser. No. 687,077
Claims priority, application Germany, May 27, 1975, 2523339
Int. Cl.[2] F16L 1/00; E21D 11/00
U.S. Cl. 61—105 8 Claims



8. A method of laying a pipe-line composed of pipe sections arranged end-to-end; said method comprising excavating an open trench, introducing a pipe section into a receptacle located in the trench, arranging the pipe section in end-to-end relationship with a pipe section previously-installed and projecting through a sealed opening into the interior of the receptacle, displacing the receptacle to follow-up the advancement of the trench and repeating said sequence and whenever the pipe section to be introduced is provided with an access tube projecting outwardly from its exterior periphery carrying out the following additional steps: utilizing a hollow unit to extend the interior of the receptacle and engage on the exterior of the previously-installed pipe section to form part of the sealed opening, removing or displacing a plate defining part of the sealed opening to permit the tube of the newly-introduced pipe section to pass into the interior of the unit as the receptacle is displaced, relocating the plate to re-establish a seal with the pipe section inwardly of the receptacle relative to its tube and removing or displacing the unit to expose the tube of the pipe section.

4,059,966
AIRFLOW DISTRIBUTION ARRANGEMENT FOR A SIDE-BY-SIDE REFRIGERATOR

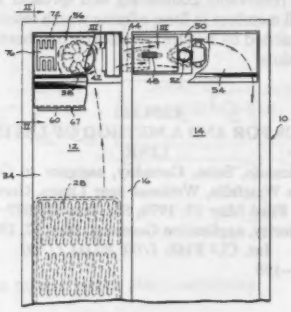
Howard D. F. True, Jr., Fern Creek, Ky., assignor to General Electric Company, Louisville, Ky.

Filed July 26, 1976, Ser. No. 708,431
Int. Cl.[2] F25D 17/06
U.S. Cl. 62—414 2 Claims

1. In a side-by-side refrigerator of the type including a freezer compartment, a fresh food compartment, a vertical partition separating the compartments, an evaporator air channel extending vertically along the rear wall of the freezer compartment and having an air outlet near the top for directing cool evaporator air generally forward, means for forcing

circulation of air through the evaporator air channel and out the air outlet near the top, and a passageway in the partition for passing cool evaporator air into the fresh food compartment, an airflow distribution arrangement comprising:

a cover spaced forwardly of the evaporator air channel outlet such that cool evaporator air is directed towards and tends to travel down the inner surface of said cover, said cover having a bottom opening for discharging cool evaporator air into the freezer compartment, and said



cover defining a lateral duct communicating with the passageway in the partition; and

a horizontally-extending inward bulge formed in said cover and located generally between the region on the inner surface of said cover against which cool evaporator airflow is directed and the cover bottom, said bulge serving to interrupt the otherwise smooth downward flow of air to produce back pressure to force a portion of the cool evaporator airflow through the partition passageway into the fresh food compartment.

4,059,967

PROCESS FOR FREEZING BLOOD PLATELETS

Arthur W. Rowe, Stamford, Conn., and George Dayian, Albany, N.Y., assignors to The Community Blood Council of Greater New York, Inc., New York, N.Y.

Filed Feb. 19, 1976, Ser. No. 659,397
Int. Cl.[2] F25D *17/02*
U.S. Cl. 62—64 **13 Claims**

1. A process for preserving blood platelets which comprises:

A. Contacting said platelets with an aqueous saline solution containg 4 to 7 weight percent glycerol and 2 to 6 weight percent glucose, the glycerol being employed in at least a 5 : 1 volume solution to volume platelet ratio;

B. Removing supernatant liquid;

C. Concentrating platelets to about 20 mg platelet protein/ml;

D. Thereafter freezing said platelets at a rate of at least 20° C per minute.

4,059,968

REFRIGERATION SYSTEM

Robert R. Ross, Wheaton, Ill., assignor to H. A. Phillips & Co., St. Charles, Ill.

Continuation-in-part of Ser. No. 484,271, June 28, 1974, abandoned. This application Apr. 5, 1976, Ser. No. 673,601
Int. Cl.[2] F25B *41/00*
U.S. Cl. 62—174 **2 Claims**

1. A circulating refrigeration system, comprising:

a. compressor means for compressing vaporized refrigerant,

b. condensor means for receiving compressed refrigerant gas from said compressor means and removing heat from said gas to liquify all or a substantial portion of it,

c. a receiver tank for receiving said liquified refrigerant from said condensor means and having a predetermined relatively high gas pressure therein,

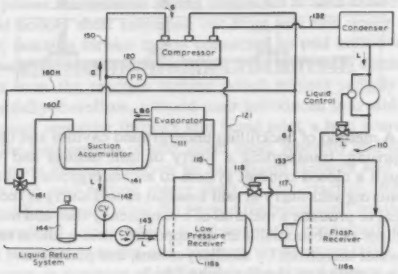
d. evaporator means,

e. a receiver tank for receiving refrigerant liquid from said high pressure receiver tank and having a predetermined lower gas pressure therein,

f. liquified refrigerant from said low pressure receiver tank being forced from said low pressure receiver tank through said evaporator means in an amount substantially exceeding the evaporator means requirement for achieving the system's designed refrigeration output and refrigerant vaporized in said evaporator means being returned to said compressor means for compression,

g. said compressor means being a screw compressor having a low pressure inlet to a first stage, an intermediate pressure inlet to a second stage, and a high pressure outlet,

h. said vaporized refrigerant from said evaporator means being returned to said low pressure inlet,



i. at least a portion of the vaporized refrigerant which reaches said high pressure receiver tank being bled to said compressor through said intermediate pressure inlet,

j. means for accumulating unvaporized liquid refrigerant from said evaporator,

k. said unvaporized liquid refrigerant being substantially cooler than the saturated liquid in said low pressure receiver tank as a result of the evaporation of refrigerant,

l. dump tank means for receiving liquid refrigerant from said accumulating means, and

m. means connecting said high pressure receiver tank with said dump tank means through a control valve,

n. said control valve being effective upon receipt of a predetermined signal to direct flash gas under pressure from said high pressure into said dump tank means to force liquid refrigerant therein back to said low pressure receiver tank.

4,059,969

AIR CONDITIONED SHELTER

Thomas Y. Awalt, Jr., 804 Poinciana Drive, Gulf Breeze, Fla. 32561

Continuation-in-part of Ser. No. 487,721, July 1, 1974, abandoned, and Ser. No. 540,866, Jan. 14, 1975. This application Dec. 1, 1975, Ser. No. 636,675
Int. Cl.[2] F25B *27/02*
U.S. Cl. 62—238 **19 Claims**

11. A mechanically air conditioned shelter having external walls and a living space and comprising in combination:

a. liquid energy storage including:

1. liquid storage space, and

2. liquid;

b. a first heat transfer means coacting with said liquid;

c. a variable speed gas compressor;

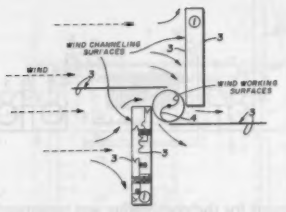
d. a second heat transfer means coacting with a fluid medium external to said shelter and said storage space;

e. fluid transfer means between each of said first and second heat transfer means and said compressor, whereby compressed fluid may be evaporated in either of said heat

transfer means and condensed in the other of said heat transfer means;

f. heat transfer and distribution means whereby heat is transferred to or from said storage space from or to said living space and distributed within said living space;

g. a plurality of blades positioned radially and moveable about a generally vertical axis so that upon movement about said axis, each blade presents a generally vertical planar surface workably opposed to at least one line of force extending along a generally tangential line from any point thereon to the point of departure of said tangential line from the arc described by the rotation of the periphery of the blades;



h. rotatable mounting means for said blades whereby rotation of said blades about said axis is permitted;

i. mechanical power transfer means between said blades and said compressor, and

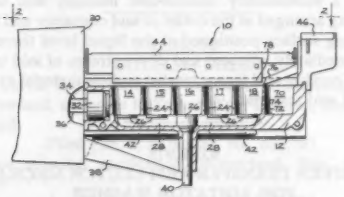
j. fixed wind deflector means including at least a substantial portion of the outer surface of said external walls of said shelter and comprising a plurality of fixed generally planar surfaces at least two of which are generally vertical and extending generally tangential to said arc described by the periphery of said blades upon rotation thereby to funnel prevailing winds tangentially toward said arc so as workably to engage said blades.

4,059,970

AUTOMATIC ICEMAKER INCLUDING MEANS FOR MINIMIZING THE SUPERCOOLING EFFECT

Leopold Loeb, Louisville, Ky., assignor to General Electric Company, Louisville, Ky.

Filed Oct. 15, 1976, Ser. No. 732,772
Int. Cl.[2] F25C *1/04, 1/00*
U.S. Cl. 62—353 7 Claims



1. In a batch type automatic icemaker adapted for installation in the freezer compartment of a refrigerator and including a mold having an ice-forming cavity, means for filling said ice-forming cavity with water, control means, and means responsive to the control means for removing ice pieces from said ice-forming cavity, the combination with said ice-forming cavity of:

means for retaining a piece of ice in communication with said ice-forming cavity throughout each entire icemaker operating cycle;

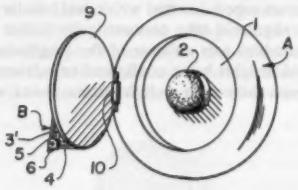
whereby the retained ice piece reliably provides a seed ice crystal during the next operating cycle, to initiate freezing of water in said ice-forming cavity with a minimum of supercooling.

4,059,971

EARRING HAVING MAGNETICALLY SECURED DISPLACEABLE ORNAMENT FOR FACILITATING TELEPHONING

Ota Shoji, 207-9 Daibutsugahira, Nishiberano, Mikage-cho, Higashinada, Kobe, Japan

Filed Oct. 7, 1976, Ser. No. 730,316
Int. Cl.[2] A44C *7/00*
U.S. Cl. 63—14 R 4 Claims



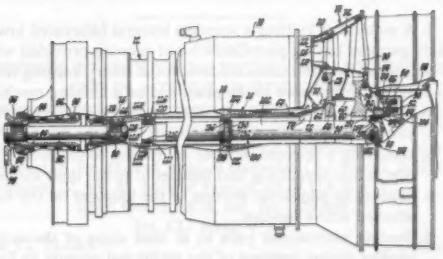
1. An earring construction for use by a wearer and which will facilitate phone calling without interference, comprising an earring decorative body having an exterior ornamental side which is adapted to project outwardly from the person's ear and an opposite earfacing side, first magnet means mounted on said earfacing side, an ear-engagement mounting pivotally mounted on said body adjacent one side thereof and having at least a first side facing said body with at least a portion defining second magnet means attractable to said first magnet means to hold said body close against said ear-engagement mounting, said ear-engagement mounting including an opposite second side facing the wearer's ear, an ear-engagement device carried by said mounting on said opposite second side for holding the earring on a person's ear, said body being pivotal outwardly from said ear-engagement mounting to a position said body alongside the ear so as to free the ear of the wearer so that the earring will not interfere with the engagement of the ear by a telephone earpiece.

4,059,972

TURBINE SHAFT BALANCING

Paul E. Beam, Jr., Indianapolis, and Charles K. Meyers, Danville, both of Ind., assignors to General Motors Corporation, Detroit, Mich.

Division of Ser. No. 490,907, July 22, 1974, Pat. No. 3,964,342.
This application Mar. 17, 1976, Ser. No. 667,629
Int. Cl.[2] F16C *1/00*
U.S. Cl. 64—1 V 2 Claims



1. A rotor balance assembly comprising: a drive shaft having a longitudinal axis and a mass thereon rotatable about said longitudinal axis, said drive shaft including an elongated tubular portion thereon having a first access opening thereto, a plurality of axially spaced reference surfaces on the interior of said tubular portion, each of said surfaces being formed continuously circumferentially of said interior, a balance tube located

interiorly of said tubular portion in radially inwardly spaced relationship thereto, means for removably connecting one end of said balance tube to one end of said tubular portion, a plurality of axially spaced index splines on the outer periphery of said balance tube, an annular balance weight removably secured to each of said index splines against rotation with respect to said tube and arcuately adjustable through a plurality of circumferentially indexed positions when said balance tube is removed from said shaft, each of said balance weights having an outer peripheral surface engageable with said reference surfaces when the balance tube is inserted within said tubular portion of said shaft to align said tube concentrically within said shaft with its longitudinal axis colinear of the longitudinal axis of said shaft, said weights being configured to balance said shaft means and mass thereon in multple planes in-situ within said shaft.

4,059,973

CIRCULAR KNIT LOWER BODY GARMENT AND METHOD OF MANUFACTURE

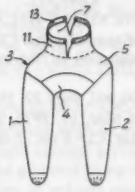
Robert Gresillon, Colroy la Grande, France, assignor to Prenihan AG, Zurich, Switzerland

Continuation of Ser. No. 335,893, Feb. 29, 1973, abandoned. This application Aug. 18, 1975, Ser. No. 605,526

Claims priority, application France, Apr. 28, 1972, 72.15303; Nov. 16, 1972, 72.40673

Int. Cl.[2] A41B 9/02

U.S. Cl. 66—177 **16 Claims**



1. A method of knitting a seamless integral bifurcated lower body garment having pants and a waist opening provided with a waistband, by continuous unidirectional rotary knitting from one end of the garment to the other end on a knitting machine having a circle of needles, said method comprising the steps of:

a. knitting a first portion of the garment,

b. removing a selected number of needles to inactive position, while permitting said needles to retain their stitches.

c. knitting an additional portion of the garment on the non-selected active needles,

d. feeding elastomeric yarn to at least some of the active needles during knitting of the additional portion to form knitted elasticated fabric portions providing segments of an integral knitted elastic waistband,

e. forming an opening in the garment during knitting of the additional portion to provide the waist opening,

f. and, following knitting of the additional portion, putting the inactive needles back into action and knitting the remainder of the garment.

4,059,974

APPARATUS FOR THE CONTINUOUS TREATMENT OF ENDLESS MATERIAL, ESPECIALLY THE SHRINKING THEREOF

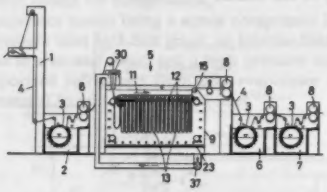
Hans Fleissner, Rieben, Switzerland, assignor to Vepa AG, Switzerland

Filed Dec. 15, 1975, Ser. No. 640,697

Claims priority, application Germany, Oct. 3, 1975, 2544240; Oct. 3, 1975, 2544241; Dec. 14, 1974, 2459217; Dec. 19, 1974, 2460117

Int. Cl.[2] D06B 21/00, 3/12, 3/20

U.S. Cl. 68—15 **22 Claims**



1. An apparatus for the continuous wet treatment, especially shrinking, relaxing and/or bulking of endless material, including webs having an operating width, made of textured polyester fabric or knit which comprises a container for retaining a treatment liquor at a liquid level, said container having an inlet and an outlet for said endless material, an endless conveying means having support rods extending transversely across the width of the endless material within said container for transporting the material through the liquor in the form of suspended loops in an operating direction from the inlet to the outlet of the container, vertically disposed partition means positioned within said container for defining a treatment chamber having a top portion and a bottom portion and a liquid recycling chamber, said partition means having an upper portion and a lower portion, being spaced from an outer wall of the container and being arranged so that the treatment chamber and the recycling chamber are in communication with one another at the upper portion and at the lower portion of the partition means, means for producing a liquid circulation from the treatment chamber into the liquor recycling chamber, said liquor being directed from the top portion of the treatment chamber to the bottom portion of the treatment chamber, means for supplying heat to the liquor within said container and take-off means for removing the endless material from said liquor in a substantially tension-free manner, said take-off means being arranged at the outlet of said container and having a supporting surface positioned at the liquid level therein and means immediately adjacent and down-stream of said take-off means for cooling said liquor treated endless material to fix the volume of said material.

4,059,975

BELT-DRIVEN TRANSFER ARM CLUTCH MECHANISM FOR AGITATOR WASHER

James W. Jacobs, Dayton, Ohio, assignor to General Motors Corporation, Detroit, Mich.

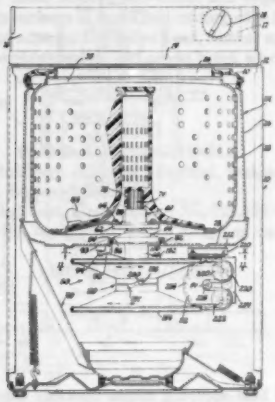
Filed Nov. 29, 1976, Ser. No. 745,576

Int. Cl.[2] D06F 13/02, 37/40

U.S. Cl. 68—23.7 **3 Claims**

1. In a washing machine, a tub, an agitator in said tub, means for rotably supporting said tub, means for rotating said tub, agitate shaft means enclosed by a portion of said rotating means, a power drive shaft, and power transmitting means drivingly connecting said drive shaft to said agitator shaft, means for oscillating said agitator, said power transmitting means comprising upper and lower concentrically arranged driven pulleys rotatably carried in fixed respective planes with respect to said agitator shaft means, drive belt means encircling said driven pulleys and opposite ends of said drive shaft,

whereby said driven pulleys will be simultaneously driven by opposite directions of rotation by rotation of said drive shaft, reversible clutch means between said driven pulleys for drivingly rotating said agitate shaft means relative to either of said driven pulleys, said clutch means including a radial transfer arm pivotally secured to said agitator shaft means intermediate the driven pulleys for pivotal movement about a horizontal axis through the axis of said agitate shaft means, said upper driven pulley having a downwardly opening drive notch formed therein, said lower driven pulley having an upwardly opening drive notch formed therein, said notches each having cam portions in mirror image relation upon being rotated into substantial vertically opposed alignment, whereby said lower



pulley notch being operative to engage said transfer arm to effect a driving relationship between said drive shaft and said lower pulley and rotate said agitator shaft in a first direction through a predetermined angular stroke, said clutch means operative upon said lower pulley being rotated through said stroke positioning said lower notch in substantial vertically opposed alignment with said upper pulley notch, such that said transfer arm is free to move from its engaged position along said lower pulley notch cam portion under the dislodging force of the rotation of said lower pulley, whereby said transfer arm is pivoted upwardly and engaged by said upper pulley notch to effect a driving relationship between said drive shaft and said upper pulley and rotate said agitator shaft in a reverse direction through a predetermined angular stroke.

4,059,976

ROLLING MILL

Alfred Christ, Zurich, and Rolf Lehmann, Mutschellen, both of Switzerland, assignors to Escher-Wyss Limited, Zurich, Switzerland

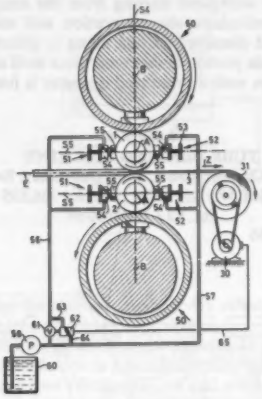
Filed Feb. 6, 1976, Ser. No. 655,767

Claims priority, application Switzerland, Feb. 13, 1975, 1765/75

Int. Cl.² B21B *37/00, 29/00, 31/32*

U.S. Cl. 72—19 **1 Claim**

1. A rolling mill for rolling materials in web form which comprises a pair of working rolls between which the material is rolled in a rolling plane, a pair of sag-compensating back-up rolls on respective opposite sides of said rolling plane and engaging said pair of working rolls respectively, each of said sag-compensating back-up rolls having a fixed support beam with a roll shell rotatable about the beam, at least one hydrostatic support means mounted on the beam for exerting pressure against the shell, said hydrostatic support means having at least one chamber formed in said beam, and at least one piston member disposed within said chamber and movable therein, means to supply fluid under pressure to said chamber, said piston member having an end portion facing the interior of said shell, said end portion having a plurality of hydrostatic bearing pockets formed therein, said piston member having a throttling duct communicating each of said pockets with said chamber to permit fluid under pressure to flow through said ducts to said pockets thereby continuously contacting interior surface portions of said shell and causing each piston to exert hydrostatic pressure on the respective shell toward the respective working roll in a support plane passing through the axes of corresponding working and back-up rolls, while said fluid under pressure continuously contacting said shell removes from said shell, heat generated during said material rolling process, said support plane for at least one of said working rolls being perpendicular to the rolling plane, said rolling mill further including a pair of lateral supporting means for each of said working rolls positioned on the downstream and upstream sides thereof with respect to the direction of movement of the material being



rolled for exerting forces on each working roll in opposite directions in a plane parallel to the rolling plane, each lateral supporting means including at least one hydrostatic support device, supply means for supplying a coolant hydraulic medium under pressure to each of said hydrostatic support devices, said support devices each bearing directly against the surface of the respective working roll with a flow of said hydraulic medium of the device between the device and the surface of the working roll, means for exerting a tractive force on the material being rolled, and control means responsive to said tractive force for controlling the relative hydraulic pressures in the upstream and downstream support devices of each working roll to produce differences in the lateral forces acting thereon, said differences acting in a direction counter to said tractive force.

4,059,977

METHOD OF PRODUCING HERMETICALLY SEALED END IN A TUBULAR WORKPIECE

Vladimir Georgievich Kaporovich, ulitsa Lenina, 2, kv. 106; Vitaly Kirillovich Udovenko, ulitsa Parkovaya, 35, kv. 105, both of Kramatorsk; Viktor Petrovich Krasnorutsky, 4 Mikroraion, 5, kv. 41, and Akhmet Galievich Chechenets, 5 Mikroraion, 27, kv. 41, both of Frunze, all of U.S.S.R.

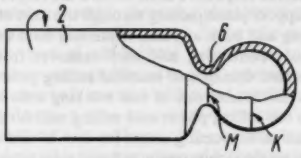
Filed Oct. 5, 1976, Ser. No. 729,846

Int. Cl.² B21D *41/04*

U.S. Cl. 72—69 **2 Claims**

1. A method of producing a sphere having a hermetically sealed end at an end of a tubular cylindrically shaped workpiece, wherein the diameter of the sphere is less than the diameter of the tubular workpiece, comprising the steps of heating a tubular workpiece end to a forging temperature; reducing the diameter of said end of the tubular heated workpiece until a tubular end portion is obtained with a diameter equal to the diameter of the sphere to be formed; roll-shaping the end

portion of the reduced diameter tubular end portion of the workpiece until a semi-spherical shaped hermetically sealed end is formed; roll-shaping the remaining portion of the reduced diameter end portion of the workpiece to form a sphere comprising the steps of roll-shaping the reduced diameter



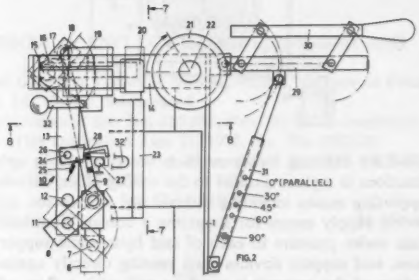
portion of the workpiece starting from the conjugation between said semi-sphere shaped portion and said cylinder-shaped reduced diameter portion along a sphere generatrix towards the main portion of said workpiece until an intermediate neck portion with a prescribed diameter is formed.

4,059,978

TUBE BENDING MACHINE

Paul Dettling, Chaletstrasse 1, 8600 Dubendorf, Switzerland

Filed July 19, 1976, Ser. No. 706,835
Int. Cl.² B21D *7/04*
U.S. Cl. 72—156 **8 Claims**



1. A tube bending machine having hydraulic drive including a hydraulic cylinder characterized by the following: a single hydraulic pressure cylinder means, a lever system, a bending roller, the lever being operative in a first partial stroke of its driving stroke so as to press a tube to be bent against the bending roller, a pivotally mounted bending arm having detent means associated therewith, and the lever system being operative in a second partial stroke to swing the pivotally mounted bending arm around the axis of rotation of the bending roller, the detent means normally restraining the bending arm and being released by the said lever system at the end of the said first partial stroke.

4,059,979

MEANS FOR FLARING OPENINGS IN CYLINDRICAL BODIES

Gordon E. Mackie, Utica, and Peter A. Morris, Jackson, both of Miss., assignors to Allis-Chalmers Corporation, Milwaukee, Wis.

Filed June 23, 1976, Ser. No. 698,831
Int. Cl.² B21D *51/40*
U.S. Cl. 72—342 **3 Claims**

1. An apparatus for flaring the edge of an opening formed in a cylindrical workpiece comprising:

a stationary frame having a work station;

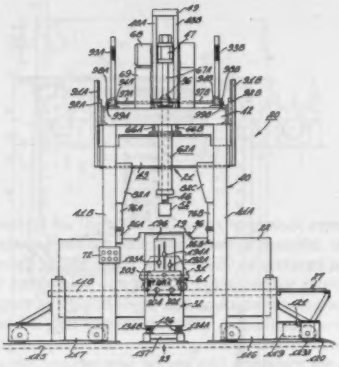
a flaring tool in said work station engageable in the opening formed in the cylindrical workpiece;

a ram movably supported by said frame in said work station for vertical movement into and out of coupled engagement with said flaring tool;

power means operable to effect coupling engagement of said ram with said flaring tool and to forcefully engage the flaring tool with the edge of the opening in the cylindrical workpiece to form a circular collar portion around the opening;

clamping means carried by said frame for securing the workpiece in the work station;

heat applying means carried for movement into a position to heat an area of the cylindrical workpiece adjacent the opening to be flared to a plastic state;



a second heat applying means operably disposed to apply heat to the cylindrical workpiece on a side thereof which is diametrically opposite to the side which said first heating means applies its heat; and,

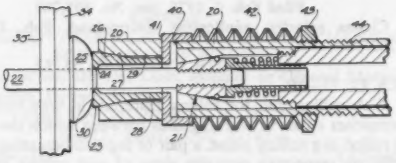
control means operably connected to effect a predetermined movement of the heat applying means in a path of travel which is parallel to the contour of the cylindrical workpiece from a point of rest to a point short of a vertical plane which passes through the longitudinal axis of the cylindrical workpiece.

4,059,980

METHOD AND MEANS FOR INSTALLING BLIND FASTENERS

Frank B. Nance, Los Alamitos, Calif., assignor to Olympic Fastening Systems, Inc., Middletown, Ohio

Filed Nov. 17, 1975, Ser. No. 632,394
Int. Cl.² B21J *15/34*
U.S. Cl. 72—391 **7 Claims**



1. Setting means for installing a blind fastener comprised of a headed rivet sleeve and a headed pin inserted therewithin, the head of the sleeve being adapted to engage the top side of the work being fastened, the head of the pin engaging the end of the sleeve remote from the sleeve head, the sleeve end and pin head being beyond the blind side of the work, and the pin having a tail extending beyond the sleeve head which means comprises: a support housing; a chuck assembly slidably mounted within said support housing and having means to

grasp the tail of said pin; a collet slidably mounted within said support housing and protruding beyond said support housing, said collet having a forward portion to engage a sleeve head; a first cam surface on said support housing and a second cam surface on said collet, said cam surfaces being arranged to engage one another; a cutting edge on said collet adjacent said forward portion; abutment means slidable in said support housing, said collet having a rearward portion to engage said abutment means; and yieldable means cooperating with said abutment means to prevent initial movement of said abutment means and said collet; whereby when the load forces exerted by movement of the chuck assembly are sufficient to upset the blind fastener, continued movement of said chuck assembly will thereafter cause relative movement and engagement between said cam surfaces to move said cutting edge into said pin to weaken same adjacent the sleeve head, further movement of said chuck assembly causing said pin to break where so weakened.

4,059,981

BLIND RIVETING TOOLS

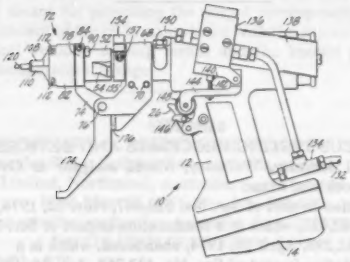
David John Holloway, Aldridge, England, assignor to USM Corporation, Boston, Mass.

Filed Sept. 22, 1976, Ser. No. 725,530

Claims priority, application United Kingdom, Jan. 22, 1976, 2412/76

Int. Cl.[2] B21J *15/34*

U.S. Cl. 72—391 **8 Claims**



1. A pull-through blind riveting tool comprising a housing, a rivet-setting mandrel having a head and a stem and movable toward and from an operating position in the housing, mandrel-pulling means reciprocably mounted in the housing, an assembly for movably supporting the mandrel and including abutment means openable to allow axial passage of a head of a rivet on the mandrel and closeable to abut the rivet head during relative mandrel retraction, and means interconnecting the assembly and the housing permitting their limited relative separation and approach to allow a rivet to be assembled on the mandrel stem when the mandrel head is engaged and positioned by the relatively separated assembly.

4,059,982

APPARATUS FOR THE MEASUREMENT OF THERMAL PROPERTIES OF BIOMATERIALS

Harry Frederick Bowman, Needham, Mass., assignor to Massachusetts Institute of Technology, Cambridge, Mass.

Filed Aug. 29, 1975, Ser. No. 608,954

Int. Cl.[2] G01F *1/68*; G01N *25/18*

U.S. Cl. 73—15 A **32 Claims**

1. A method for determining physical characteristics of a medium comprising the steps of

predetermining the thermal conductivity of a heating means as a function of temperature, said heating means having a predetermined resistance versus temperature relationship;

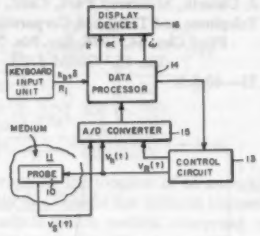
immersing said heating means in said medium;

determining the reference temperature of said medium when said medium is unheated;

applying power to said heating means sufficiently rapidly to heat said means to a volume mean temperature above said reference temperature so that the power necessary to maintain said volume mean temperature varies as a function of time;

determining the time varying relationship between the power required to maintain said heating means at said volume mean temperature after said temperature has been reached and the time during which said power is being applied thereto;

determining the temperature difference between said volume mean temperature and said reference temperature and determining the resistance of said heating means at said volume mean temperature;



determining the thermal conductivity of said medium as a function of said temperature difference, of the resistance of said heating means at said volume mean temperature, of said applied power in accordance with said time varying power and time relationship, of said predetermined thermal conductivity of said heating means, and of at least one characteristic dimension of said heating means in accordance with a thermal model of said heating means and said medium in which it is immersed wherein said heating means is treated as a distributed thermal mass and wherein heat conduction occurs in a coupled thermal system which comprises both the heating means and the adjacent region of said medium which surrounds said heating means.

4,059,983

PROCESS FOR THE DETERMINATION OF THE VISCO-ELASTIC CHARACTERISTICS OF POLYMERS AND ARRANGEMENT TO CARRY OUT THE PROCESS

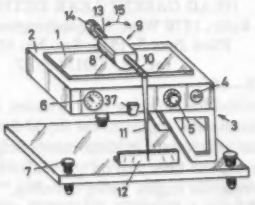
Christoph Fritzsche, Villars-sur-Glane, Switzerland, assignor to Lonza, Ltd., Gampel, Switzerland

Filed Sept. 2, 1976, Ser. No. 719,708

Claims priority, application Switzerland, Sept. 2, 1975, 11351

Int. Cl.[2] G01N *3/54*

U.S. Cl. 73—15.6 **18 Claims**



1. A process for the determination of the visco-elastic characteristics of a polymer sample having a flat surface, which comprises the steps of:

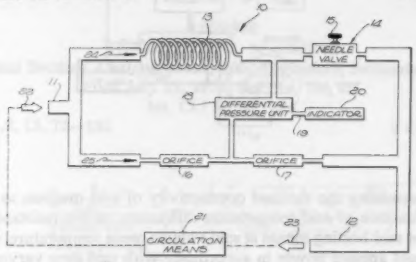
a. spatially arranging the polymer sample so that its flat surface is an upper horizontal surface;
b. placing a rolling pendulum on the flat horizontal sample surface of the polymer sample, the rolling pendulum being supported thereon in a manner which allows the rolling pendulum to freely roll in an oscillating manner;
c. varying the temperature of the polymeric sample;
d. concurrently with step (c), exciting the rolling pendulum to free, damped rolling oscillations at the varied temperature of the polymeric sample; and
e. measuring the frequency and damping of the rolling oscillations of the rolling pendulum in dependence on the temperature of the polymeric sample.

4,059,984

FLUID LEAK DETECTOR

William J. Uhlarik, Monterey Park, Calif., assignor to International Telephone and Telegraph Corporation, New York, N.Y.

Filed Oct. 14, 1976, Ser. No. 732,497
Int. Cl.² G01M *3/28*
U.S. Cl. 73—40.5 R **8 Claims**



1. A fluid flow detector, said detector comprising: first, second, third and fourth conduits; an inlet; an outlet, said first and second conduits being connected in succession from said inlet to said outlet, one of said first and second conduits having an adjustable valve, said third and fourth conduits being connected in succession from said inlet to said outlet, each of said third and fourth conduits including a constriction to the flow of fluid therethrough such that the flow through said third and fourth conduits is substantially smaller than that through said first and second conduits; a differential pressure unit (DPU); a fifth conduit connected from between said first and second conduits to said DPU; a sixth conduit connected from between said third and fourth conduits to said DPU; and means connected from said DPU to indicate the difference between the pressures within said fifth and sixth conduits, said indicator means being actuated when the other of said first and second conduits is leaking.

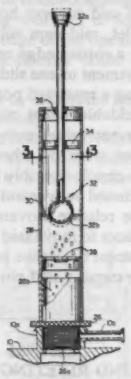
4,059,985

HEAD GASKET LEAK DETECTOR

Buford L. Kelly, 1570 West St., Southington, Conn. 06489

Filed June 3, 1976, Ser. No. 692,463
Int. Cl.² G01M *3/02*
U.S. Cl. 73—46 **11 Claims**

7. A method for isolating that cylinder, in a multi-cylinder internal combustion engine of the liquid cooled type, having a blown head gasket, said method comprising:
a. removing the filler cap on the radiator filler opening,
b. removing the engine valve covering,
c. inserting an adaptor in said filler opening, said adapter having a reservoir defining structure associated therewith and an indicator device movably mounted therein,
d. filling said reservoir with liquid to a level such that the indicator floats freely therein,
e. operating the engine to compress gases in the various cylinders, thereby forcing gas to escape through the



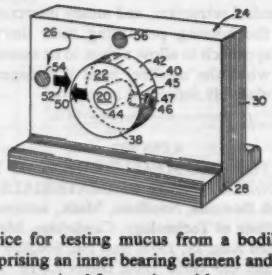
blown head gasket into the engine cooling system and cause movement of the indicator.

4,059,986

MUCUS TESTING PROCESSES AND DEVICES

Samuel R. Schuster, Wellesley, Mass., assignor to Ovutime, Inc., Brookline, Mass.

Continuation-in-part of Ser. No. 523,047, Nov. 12, 1974, Pat. No. 3,982,423, which is a continuation-in-part of Ser. No. 462,298, April 19, 1974, abandoned, which is a continuation-in-part of Ser. No. 433,767, Jan. 16, 1974, abandoned, which is a continuation-in-part of Ser. No. 300,187, Oct. 24, 1972, abandoned, and a continuation-in-part of Ser. No. 472,611, May 23, 1974, abandoned, which is a continuation-in-part of Ser. No. 300,187, Oct. 24, 1972, abandoned. This application Sept. 10, 1976, Ser. No. 722,228
Int. Cl.² G01N *11/00*
U.S. Cl. 73—54 **6 Claims**



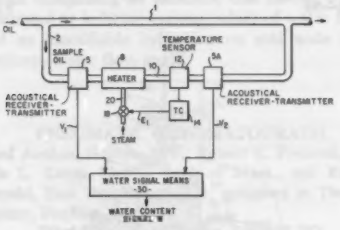
1. A device for testing mucus from a bodily cavity, said device comprising an inner bearing element and an outer bearing element constrained for motion with respect to each other, means for biasing said elements for said motion, and means for indicating the occurence of such motion, said inner bearing element and said outer bearing element have inner and outer bearing surfaces, each of said bearing surfaces having a surface finish ranging from 8 to 125 microinches in valley to peak height.

4,059,987

APPARATUS AND METHOD FOR MEASURING THE WATER CONTENT OF OIL FLOWING IN A PIPE

Donald J. Dowling, Houston, and William Schoen, Missouri City, both of Tex., assignors to Texaco Inc., New York, N.Y.

Filed Oct. 20, 1976, Ser. No. 734,060
Int. Cl.² G01N 25/58
U.S. Cl. 73—61.1 R 8 Claims



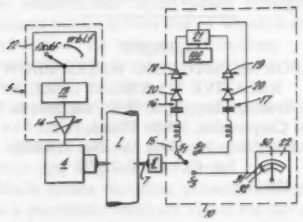
1. Apparatus for providing an output corresponding to the water content of oil flowing in a pipe comprising means for continuously sampling the oil to provide a stream of sample oil, means for changing the temperature of the sample oil by a predetermined amount, means for measuring the acoustical velocity of the sample oil prior to the temperature change and after the temperature change and providing corresponding signals, and output means connected to acoustical velocity sensing means for providing the output corresponding to the water content of the oil in accordance with the signals from the acoustical velocity sensing means and the known predetermined temperature change.

4,059,988

PRELIMINARY SCREENING OF WOODEN POLES

Alan Douglas Shaw, Geilston Bay, Australia, assignor to Fanner Pty. Limited, Northmead, Australia, a part interest

Filed May 24, 1976, Ser. No. 689,434
Claims priority, application Australia, June 5, 1975, 1891/75
Int. Cl.² G01N 29/00; G01M 7/00
U.S. Cl. 73—579 15 Claims



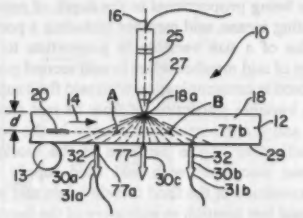
1. A method of preliminary screening a wooden pole to see if its characteristics are such that a more thorough examination is called for, comprising injecting into the pole, at a first position, a mechanical signal of constant amplitude obtained from a hammer having a reproducible performance; connecting to a listening point on the other side of the pole an electro mechanical transducer providing an electrical output significant of the level of mechanical vibratory energy present at the listening point; passing the electrical output through two filters having mutually exclusive pass bands, the first filter passing a frequency or range of frequencies found empirically to be virtually unaffected by the condition of the pole and the second filter passing a frequency or range of frequencies whose amplitude is found empirically to be significantly affected by the condition of the pole; comparing the levels of the electrical outputs of the two filters with one another; and providing a read-out value of each electrical output so that, by comparing the read-out values, a decision may be taken on whether the pole should be examined more thoroughly.

4,059,989

NON-DESTRUCTIVE EXAMINATION OF AN ARTICLE PARTICULARLY A TIRE, WITH ULTRASONIC ENERGY

George H. Halsey, Indiana, Pa., assignor to The Goodyear Tire & Rubber Company, Akron, Ohio

Filed Dec. 10, 1976, Ser. No. 749,545
Int. Cl.² G01N 29/04
U.S. Cl. 73—598 8 Claims



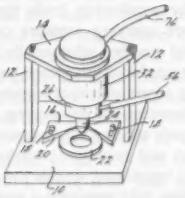
1. Method of determining the location of an anomaly in an article and particularly in a vehicle tire without impairment of the integrity of the article which method comprises, moving the article at a constant rate in liquidfree space with respect to a reference line normal to a surface of the article, continuously impacting wave energy of 20 kilohertz to 100 kilohertz on said surface at the reference line, receiving wave energy emergent from the article at a plurality of locations each spaced in the direction of movement of the article, detecting a change in the emergent wave energy at each of said locations to provide a first signal at the first of said locations and a second signal at the second of said locations, measuring the time of travel by said article relative to the reference line between the first and the second said signal, and displaying or recording said time, said time being indicative of the depth of said anomaly below said surface.

4,059,990

MATERIALS HARDNESS TESTING DEVICE

Douglas Glover, and Marvin J. Minter, both of Ann Arbor, Mich., assignors to Federal-Mogul Corporation, Southfield, Mich.

Filed Aug. 2, 1976, Ser. No. 710,445
Int. Cl.² G01N 3/40
U.S. Cl. 73—81 17 Claims



1. A hardness testing device comprising a framework, a head including penetrating means supported by said framework for movement relative to a workpiece to and from a stand-by position spaced from the surface of the workpiece and an indented test position, means for applying a predetermined opposed force to said penetrating means and workpiece when in said test position to effect a penetration of the workpiece by said penetrating means to a depth proportional to the hardness of the workpiece surface stratum, fluid supply means for supplying fluid at a preselected pressure, variable flow control

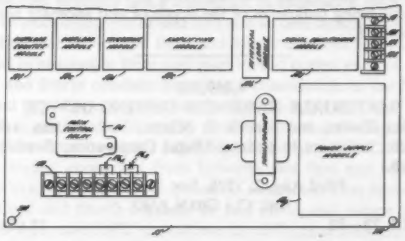
means associated with said fluid supply means movable to and from a first position when said penetrating means is in said stand-by position and a variable second position when said penetrating means is in said test position in proportion to the depth of penetration of said penetrating means, said variable flow control means comprising a member resiliently mounted on said head and including an engaging end positioned axially beyond the end of said penetrating means and adapted to contact the surface of a workpiece being tested in a region adjacent to the point of penetration of said penetrating means, said member movable through an axial displacement relative to said penetrating means in response to movement of said penetrating means to said test position, said axial displacement of said member being proportional to the depth of penetration of said penetrating means, said member including a portion defining an orifice of a size variable in proportion to said axial displacement of said member when in said second position, said orifice disposed in communication with said fluid supply means providing a variable restriction of flow of said fluid through said orifice and a corrresponding change in the condition of said fluid indicative of the hardness of the workpiece, and sensing means associated with said fluid supply means for sensing the condition of the fluid therein when said penetrating means is in said test position as indicative of the hardness of the workpiece.

4,059,991

MODULAR CONSTRUCTED LOAD SENSING SYSTEM

William P. Dybel, and Frank R. Dybel, both of 981 Wingate Road, Olympia Fields, Ill. 60461

Filed Aug. 1, 1975, Ser. No. 601,326
Int. Cl.[2] G01L *1/16*
U.S. Cl. 73—88.5 R **33 Claims**



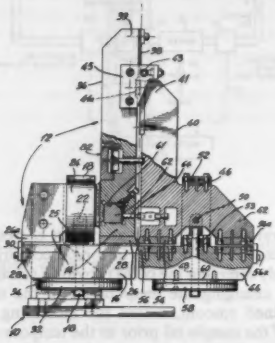
1. A system for monitoring loads that are intermittently applied to a force carrying member comprising mounting means fixed to said member substantially in line with the load to be detected, a transducer interposed between said mounting means and having a pair of output terminals with a piezoelectric crystal therebetween for developing at said output terminals electrical signals substantially proportional to the stresses experienced by to said member, electrically operated means responsive to said transducer signals for monitoring the loading on said member, said monitoring means including a main circuit board and a plurality of individual modules each containing at least one electrical component, means for engaging each said module with said board as an incident to positioning of said module at a predetermined location on said board, said engaging means including a plurality of mounting and conductor pins extending from the underside of each said module for electrically coupling said modules and the components thereon to said circuit board when said modules are in mounted position, and said modules each being individually removable from said circuit board.

4,059,992

APPARATUS FOR TESTING THE TENSILE STRENGTH OF SHEET MATERIAL

Wavell Frederick Cowan, Montreal West, and Bote Bruinsma, Hudson, both of Canada, assignors to Pulmac Instruments Ltd., Montreal, Canada.

Filed Aug. 20, 1976, Ser. No. 716,097
Claims priority, application Canada, May 31, 1976, 253719
Int. Cl.[2] G01N *3/10*
U.S. Cl. 73—95 **9 Claims**



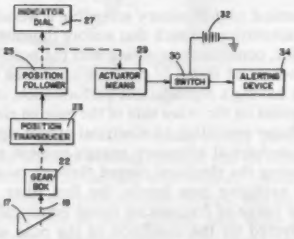
1. An apparatus for testing the tensile strength of fibers in a flat sheet comprising a base, a first support member on the base, a first pair of clamping jaws mounted to said first support member and adapted to receive and clamp a sheet material to be tested, said first support member extending above said first pair of jaws, a second support member pivoted to said first support member in pendulum manner, a second pair of clamping jaws mounted on said second support member opposite to said first pair of jaws and adapted to clamp said sheet material adjacent said first pair of jaws, said second support member pivoting in a pendulum manner and being at dead center with said second pair of clamping jaws being juxtaposed and in contact with the first jaws, means for pivotally causing the movement of the second support member away from dead center such that the pairs of jaws, while still clamping said sheet material, will move apart under pressure.

4,059,993

SYSTEM FOR MONITORING WATER FLOW ANGLE RELATIVE TO A BOAT KEEL

Leonard M. Greene, Chappaqua, N.Y., assignor to Safe Flight Instrument Corporation, White Plains, N.Y.

Filed Aug. 23, 1976, Ser. No. 716,659
Int. Cl.[2] G01C *21/00*
U.S. Cl. 73—178 R **10 Claims**



1. A device for monitoring the angle between the direction of ambient water flow and the keel of a sailboat comprising:
a sensing vane mounted on the hull of the boat immediately

forward of the leading edge of the sailboat keel for rotation about an axis substantially parallel to the longitudinal center plane of the hull,

means responsive to rotational movement of said vane for providing a rotational movement in accordance with said vane movement at a location remote from said vane, and

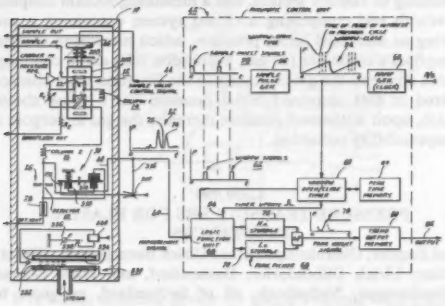
indicator means responsive to said last mentioned means for providing an indication of the flow angle, said indicator means comprising an indicator dial having a dial scale calibrated to indicate various values of water flow angle and an identifiable indication on said scale indicating optimum water flow angle.

4,059,994

PNEUMATIC CHROMATOGRAPH

Raymond Annino, Golden, N.Y.; Robert C. Prescott, Foxboro; Edwin L. Karas, Sharon, both of Mass., and Richard W. Kalinoski, East Providence, R.I., assignors to The Foxboro Company, Foxboro, Mass.

Filed Nov. 26, 1976, Ser. No. 745,392
Int. Cl.² G01N *31/08*
U.S. Cl. 73—23.1 **3 Claims**



1. In industrial instrumentation apparatus of the type including a pressure line arranged to carry a pneumatic measurement signal representing a measurement such as the concentration of eluting components from a chromatographic analyzer and wherein the measurement signal passes through maximum and/or minimum values at least one of which is desired to be detected and retained for subsequent functions;

that improvement which comprises;

a force-balanceable member;

means for applying to said member a first force corresponding to said measurement signal;

feedback means to apply to said balanceable member a feedback force opposing said first force;

said feedback means including pressure storage means to receive a pneumatic feedback signal for developing said feedback force;

pneumatic sensing means adjacent said balanceable member for producing a pneumatic feedback signal responsive to changes in the force balance of said member; and

pressure-transmitting means connecting said sensing means to said pressure storage means;

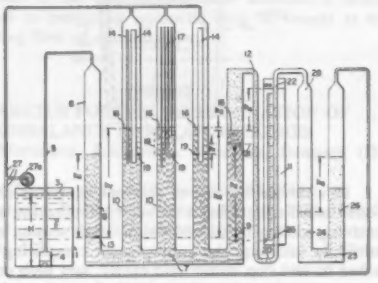
said pressure-transmitting means including check-valve means to allow flow of pneumatic fluid in one direction between said sensing means and said pressure storage means to provide that the feedback pressure in said pressure storage means tracks said measurement signal as said measurement signal varies towards one of said values, said check-valve means serving to prevent flow in the opposite direction between said sensing means and said pressure storage means so as to trap in said pressure storage means a pressure corresponding to said one value after the measurement varies away from said one value.

4,059,995

LEVEL INDICATORS FOR LIQUIDS

Raul Calderon De Palacio, Pensylvania 171, Mexico City, Mexico (18)

Filed July 28, 1976, Ser. No. 709,330
Claims priority, application Mexico, Dec. 12, 1975, 162559
Int. Cl.² G01F *23/16*
U.S. Cl. 73—301 **5 Claims**



1. Apparatus for indicating the level of liquid in a receptacle, which comprises:

a. a first U-tube having a horizontal base, a pair of vertical arms at opposite ends of the base and a plurality of vertical branches rising from said base, the base, arms and branches being in fluid communication and containing a dense indicating liquid, and means for adjusting the liquid level in said branches;

b. means for transmitting hydrostatic pressure from the receptable to the surface of said dense liquid in one of said arms of said first U-tube;

c. a second U-tube, conduit means for providing fluid communication between said other arm of said first U-tube and an arm of said second U-tube, the second U-tube being of smaller diameter than said first U-tube, and a less dense liquid extending from the surface of the dense indicating liquid in said other arm of said first U-tube through said conduit means and into said second U-tube, the height of the less dense liquid in the other arm of the second U-tube being an indication of the liquid level in said receptacle;

d. a third U-tube of larger diameter than said second U-tube and containing a less dense liquid, second conduit means for providing fluid communication between the other arm of said second U-tube and an arm of the third U-tube, there being a volume of air between the liquids in said second and third U-tubes such that any expansion or contraction in the indicating liquid contained in said other arm of the first U-tube as a result of a change in ambient temperature will produce a proportionate change in volume of the air to cause porportionally an opposing head of liquid in the other arm of the third U-tube in compensation therefor; and

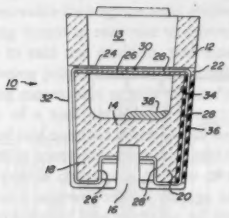
e. conduit means for connecting the free arm of the third U-tube and the branches to the atmosphere when the receptacle is selected to be open to the atmosphere or to the top of the receptacle when the receptacle is subject to a pressure different from atmospheric.

4,059,996

MOLTEN METAL SAMPLE CUP CONTAINING BLOB FOR PROMOTING CARBIDE FORMATION

Omer Paul Curé, Diepenbeek, Belgium, assignor to Electro-Nite Co., Philadelphia, Pa.

Filed Nov. 16, 1976, Ser. No. 742,293
Claims priority, application Belgium, Nov. 20, 1975, 2/54666
Int. Cl.² G01N 1/10; G01K 13/12
U.S. Cl. 73—354 11 Claims



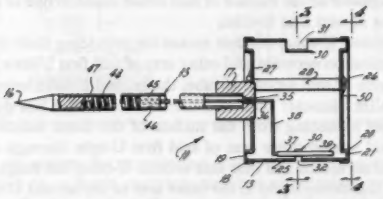
1. In a device for use in determining phase change of a molten metal comprising a refractory cup having a cavity for receiving molten metal and temperature sensing means supported by said cup, the improvement comprising a blob attached to said cup within said cavity, said blob containing a first material for promoting carbide formation mixed with a refractory material for delaying dispersion of said first material into a sample of molten iron, said blob containing a second material capable of evolving hydrogen when contacted by molten iron, said second material being waterglass, whereby said first material for promoting carbide formation may be thoroughly mixed with said molten iron.

4,059,997

MEAT THERMOMETER

David H. Trott, Cincinnati, Ohio, assignor to Crossbow, Inc., Cincinnati, Ohio

Filed Mar. 8, 1976, Ser. No. 664,624
Int. Cl.² G01K 5/62, 13/00
U.S. Cl. 73—352 6 Claims



1. A meat thermometer adapted for direct exposure to flame, smoke and grease and temperatures of the order of 500° F. comprising a pointed stem containing a bimetallic element in its pointed end,

a housing mounted on the opposite end of said stem, said housing comprising a circular disk and cap spaced from each other and lying generally in plane perpendicular to the axis of the stem,

a cylindrical indicator face fixedly sandwiched between said disk and cap, said cylindrical indicator being a strip which has its ends brought together to form a cylinder of approximately one inch outside diameter,

said cylindrical indicator face being uncovered,

indicia indelibly formed on said indicator face and adapted to withstand direct exposure to flame, smoke and grease accompanying broiling meat,

a bolt eccentrically located with respect to the axis of said stem clamping said disk and cap against said cylindrical face,

and an indicator disposed in said housing and connected to said bimetallic element, said indicator being rotatable through a path adjacent the cylindrical indicator face, said bolt being out of the normal operating path of said indicator element,

said indicator face having a circumferential slot through which said indicator is visible.

4,059,998

GAS PRESSURE THERMOMETER, AND APPARATUS FOR APPLICATION IN A GAS PRESSURE THERMOMETER

Albertus van der Kolk, and Johannes-Gerhardus Stiller, both of Roden, Netherlands, assignors to Stiko B.V., Roden, Netherlands

Filed Apr. 27, 1976, Ser. No. 680,552
Claims priority, application Netherlands, Apr. 28, 1975, 7505015
Int. Cl.² G01K 5/28, 5/36
U.S. Cl. 73—368.2 4 Claims

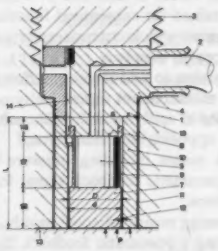
1. A gas pressure thermometer, comprising an indicator, recording or control section, and a measuring section coupled therewith and comprising a closed system containing a gas having an increased initial pressure, which measuring section comprises a container for gas, a Bourdon tube and a capillary which connects the gas container to the Bourdon tube, characterized in that increased initial pressure has a value above which, upon isothermal pressure increase, the gas undergoes a compressibility reduction.

4,059,999

PRESSURE TRANSDUCERS FOR PLASTIC SUBSTANCES

Paul Engeler, Oberohringen; Hans Ulrich Baumgartner, Winterthur; Ulrich Dübendorfer, Bassersdorf, and Hans Conrad Sonderegger, Neftenbach, all of Switzerland, assignors to Kistler Instrumente AG, Switzerland

Filed May 5, 1975, Ser. No. 574,337
Claims priority, application Switzerland, May 3, 1974, 006020/74
Int. Cl.² G01L 7/16, 9/08
U.S. Cl. 73—419 35 Claims



1. A transducer for measuring pressure characteristics of elastic material in an injection moulding device, said transducer comprising:

a hollow sleeve member having an inner peripheral wall,

first means arranged in said sleeve member for measuring pressure of a pressure medium,

second means arranged at a first end of said sleeve member for transmitting pressure characteristics to said first means, and

third means for radially and axially supporting said first and second means within said sleeve member,

wherein said second means is arranged concentrically within said hollow sleeve member with a sealing gap between

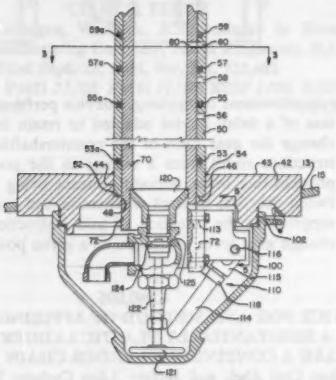
said second means and the inner wall of said hollow sleeve member, said sealing gap being of a predetermined size so that said gap in cooperation with the elastic material of said pressure medium forms a seal for sealing said first means within said hollow sleeve member from said pressure medium.

4,060,000

LADING SAMPLING DEVICE FOR A TANK

Forrest L. Baker, St. Charles, and Gunter R. Behle, St. Peters, both of Mo., assignors to ACF Industries, Incorporated, New York, N.Y.

Filed June 28, 1976, Ser. No. 700,107
Int. Cl.² G01N 1/16
U.S. Cl. 73—421 B 23 Claims



1. A lading sampling device for taking a sample from a given level in a tank comprising:

two concentric tubes including an inner tube and an outer tube mounted in an opening in the bottom of the tank and extending upwardly inside the tank; means mounting said inner tube for axial rotation relative to said outer tube; a plurality of vertically spaced sample receiving openings formed through the wall of each tube through which a lading sample may pass from the tank into the innermost tube when the respective openings in said two tubes are aligned; the sample receiving openings of one tube being spaced circumferentially relative to the sample receiving openings of the other tube such that only the sample receiving openings at the same level in each tube are aligned to receive a lading sample in a particular rotated position of said tube; sealing means provided between the inner and outer tubes between each sampling level to seal the outer tube relative to the inner tube between the various sampling levels; whereby samples of lading may be selectively taken at different levels in the tank by rotation of the inner tube relative to the outer tube; and means for effecting rotation of said inner tube relative to said outer tube.

4,060,001

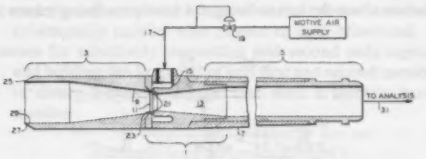
SAMPLING PROBE AND METHOD OF USE

Paul H. Archerd, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Filed Aug. 27, 1976, Ser. No. 718,302
Int. Cl.² G01N 1/24
U.S. Cl. 73—421.5 R 9 Claims

1. A sampling probe comprising:

a. a flow amplifier utilizing the Coanda wall attachment effect; and



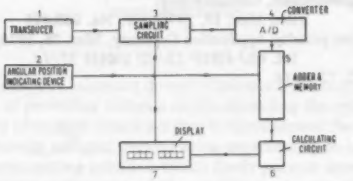
b. attached to the inlet of said flow amplifier a nozzle adapted to induce an isokinetic flow of sample at the operating flow of said amplifier.

4,060,002

APPARATUS FOR THE DETERMINATION OF UNBALANCE IN ROTATING BODIES

Angel J. Mortensen, Eskildstrup, Roennede, Denmark (DK 4683)

Filed June 12, 1975, Ser. No. 586,173
Claims priority, application Denmark, June 12, 1974, 3126/74
Int. Cl.² G01M 1/22
U.S. Cl. 73—462 7 Claims



1. An apparatus for determination of unbalance in rotating bodies consisting of:

a test bench in which a body can be fixed and rotated,

devices which measure the vibrations caused by the rotating body unbalances and convert mechanical vibrations or pressure variations to electrical signals,

electronic instrument means to evaluate the amplitudes and angular positions of the unbalances from the electrical signals, said electronic instrument means comprising sampling circuits for sampling said signals, an angular position indicating device connected to said test bench and body which delivers corresponding signals for each of a predetermined number of angular positions, e.g. 100, to said sampling circuits for activating said circuits, and storing means in which predetermined fractions of the sampled signals are stored during a number of revolutions to form average values for each of the predetermined angular positions.

4,060,003

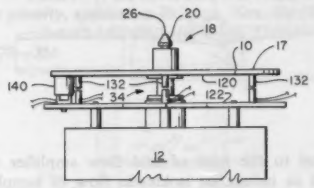
IMBALANCE DETERMINING APPARATUS AND METHOD

Thomas J. Bacsanyi, Novi, and Edward J. Harmon, Wixom, both of Mich., assignors to Ransburg Corporation, Indianapolis, Ind.

Filed Oct. 18, 1976, Ser. No. 733,433
Int. Cl.² G01M 1/08
U.S. Cl. 73—483 28 Claims

1. Apparatus for determining the amount of location of imbalance in an article to be balanced about an axis thereof comprising means for receiving the article and for positioning its axis, a base, means for substantially freely movably supporting the article receiving means relative to said base, means for sensing the orientation of the article receiving means relative

to the base and for producing at least one electrical output signal related to the sensed orientation, and means for applying a force to the article receiving means at at least one selected location about the axis to bring the article receiving means into



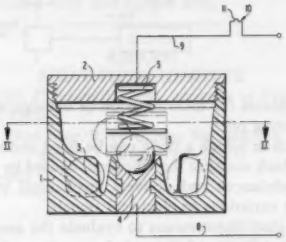
a substantially neutral orientation, said force applying means being responsive to signals related to said electrical output signals for acting between the article receiving means and said base.

4,060,004

SENSOR ADAPTED TO BE TRIGGERED BY DECELERATION FORCES

Hansjürgen Scholz, Echterdingen; Hans-Gerd Backhaus, Holzgerlingen; Luigi Brambilla, Boblingen, and Jürgen Gimbel, Gechingen, all of Germany, assignors to Daimler-Benz Aktiengesellschaft, Germany

Filed Mar. 19, 1976, Ser. No. 668,421
Claims priority, application Germany, Mar. 25, 1975, 2513023
Int. Cl.[2] G01P *15/02*; H01H *35/14*
U.S. Cl. 73—514 **7 Claims**



1. A sensor triggerable by deceleration forces which include a housing means having a bottom, a mass retained with prestress in said housing means and received, when deflected, by the bottom of the housing interior, wherein the interior space of the housing means is subdivided by generally upright partition wall means into chambers which hold fast the deflected mass; and wherein said deflectable mass serves as an electrical switching element connected via an electrical connecting line to an indicating means which undergoes a change in condition when current flows therethrough.

4,060,005

TRANSMISSION ASSEMBLY COMPRISING A MAIN GEARBOX IN SERIES WITH COUNTERSHAFTING PROVIDING AT LEAST TWO GEAR RATIOS

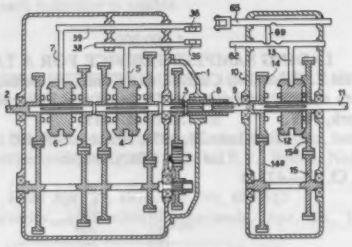
Jean Rémy Bost, Bois-Colombes, France, assignor to Automobiles Peugeot, Paris, France

Filed Aug. 30, 1976, Ser. No. 718,966
Claims priority, application France, Sept. 1, 1975, 75.26776
Int. Cl.[2] F16H *3/02*; G05G *1/00, 13/00*
U.S. Cl. 74—745 **12 Claims**

1. In a transmission assembly, in particular for an automobile vehicle, comprising:

a gearbox comprising means providing a plurality of stepped gear ratios and a first control mechanism having a change gear lever movable to various positions for selecting and changing said ratios;

and countershafting comprising means providing at least two gear ratios placed in series with the gearbox and a second control mechanism having a pre-selecting lever having at least two positions corresponding respectively to said gear ratios of the countershafting;



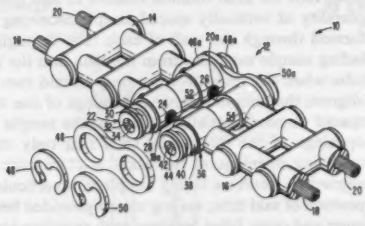
the improvement comprising a device performing the function of a delay device adapted to retain instructions to change the gear ratio of the countershafting, which instructions result from a change in the position of said pre-selecting lever, actuating means being provided between the first control mechanism and said device for suppressing the retention of said instructions when the change gear lever is brought to a given position.

4,060,006

DEVICE FOR AND METHOD OF AFFIXING THE ENDS OF A SUBSTANTIALLY PLASTIC LADDER CHAIN TO MAKE A CONTINUOUS LADDER CHAIN THEREOF

Stephen Carl Abel, and Jeffrey Allen Carlson, both of Longmont, Colo., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Sept. 20, 1976, Ser. No. 724,794
Int. Cl.[2] F16G *13/02*
U.S. Cl. 74—258 **28 Claims**



1. A master coupling link for affixing the exposed metallic cable ends of a substantially plastic ladder chain to make a continuous ladder chain thereof comprising:

plural master cross links of metal having approximately the configuration of a plastic cross link member of said substantially plastic ladder chain, but each of said plural master cross links having a plurality of cavities disposed therein with two of said plurality of cavities, termed cable cavities, spaced symmetrically and perpendicular to the longitudinal dimension thereof and extending therethrough and at a distance apart equivalent to the distance between said exposed cable ends of said substantially plastic ladder chain for receiving said exposed cable ends, and with two of said plurality of cavities, termed side pin cavities, disposed in the ends of each master cross link perpendicular to and intersecting said cable cavities;

a plurality of master link side lock pins of a metal softer than

either said exposed cable ends or said plural master cross links for insertion, under a measured deflection force, into said side pin cavities for affixing said exposed cable ends to each of said plural master cross links forming, thereby, substantially a molecular bond;

plural master link retainer clamps having dual openings therein for clamping and retaining the ends of said plural master cross links each in a position corresponding to the position of adjacent plastic cross links of said substantially plastic ladder chain; and

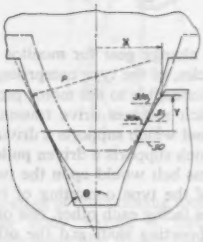
a plurality of master link retainer clips for clipping said ends of said plural master cross links against said plural master link retainer clamps for the retaining and securing thereof to said plural master cross links thereby forming said master coupling link and making said continuous ladder chain.

4,060,007

CLUTCH TEETH

George N. Levesque, Warwick, R.I., assignor to Brown & Sharpe Manufacturing Company, North Kingstown, R.I.

Filed Sept. 13, 1976, Ser. No. 722,481
Int. Cl.[2] F16H *55/08;* F16D *11/04;* B23F *1/00, 9/00*
U.S. Cl. 74—457 4 Claims



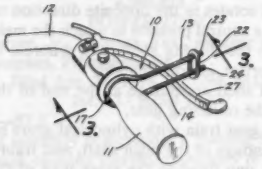
1. A clutch ring for a positively acting clutch, said clutch ring being adapted to cooperate with the cooperating clutch ring of identical construction, said clutch ring having clutch teeth, each of said teeth having faces lying substantially in a plane perpendicular to the axis of rotation of said ring, each of said teeth having a form profile which is of substantially exponential shape and each of said teeth is substantially tangent to a helicoid surface with constant lead at the pitch plane.

4,060,008

THROTTLE CONTROL DEVICE

Jerome L. Wilkinson, 1322 Des Moines St., Des Moines, Iowa 50316

Filed June 14, 1976, Ser. No. 695,521
Int. Cl.[2] G05G *5/04, 5/16*
U.S. Cl. 74—488 6 Claims



1. A throttle control device comprising:

a first member having a first end and a second end;

a second member having a first end and a second end;

means for pivotally attaching the first ends of said first and second members with respect to each other, said pivotally attaching means including a link member, means for pivotally connecting the link member to said first member along a first pivotal axis and means for pivotally connecting said link member to said second member along a second pivotal axis, said first and second pivotal axis being substantially parallel with respect to each other; and

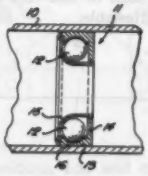
means for selectively connecting said second ends together and holding the first ends of said first and second members in direct frictional engagement with a throttle handle member.

4,060,009

BALANCING ROTORS

Howard John Wyman, Kenilworth, England, assignor to Chrysler United Kingdom Limited, London, England

Filed Oct. 23, 1975, Ser. No. 625,242
Claims priority, application United Kingdom, Oct. 30, 1974, 46987/74
Int. Cl.[2] F16F *15/22*
U.S. Cl. 74—573 R 8 Claims



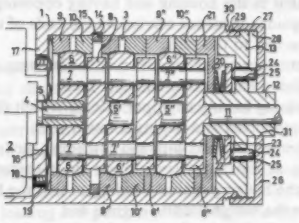
1. A method of balancing an out of balance rotor comprising the steps of providing within a cavity encircling the rotor axis a plurality of weights which are free to move around the cavity with the cavity and said weights being separated by an initially inert thermo-setting adhesive which freely permits movement of the weights within said cavity and which subsequently may be activated to permanently bond the weights to the cavity in the required positions, rotating the shaft to a speed at which the shaft is between two resonant frequencies of vibration and is nearer the lower of those frequencies so that the weights take up positions within the cavity which counteract any out of balance condition of the shaft and then temporarily applying heat to the region of the rotor having the cavity containing the weights so as to activate the adhesive and permanently lock the weights to the cavity in the balancing position.

4,060,010

REDUCTION GEAR, ESPECIALLY FOR CAMERA LENS MOTORS

Björn Harald Hedén, Stenbrogatan 3 D, S-431 43 Molndal, Sweden

Filed Sept. 25, 1975, Ser. No. 616,538
Claims priority, application Sweden, Sept. 26, 1974, 7412124
Int. Cl.[2] F16H *13/06;* F16D *7/02*
U.S. Cl. 74—798 6 Claims



1. A transmission for a camera lens motor, comprising

a. a transmission housing;
b. a motor adjacent to the housing;
c. an input shaft driven by the motor;
d. an output shaft for driving a lens part;
e. a reduction gear means between the input and output shafts;
f. the reduction gear means comprising at least two friction planetary gear sets arranged axially in series, and divided into first and second groups;
g. the first said group being arranged on the transmission input side and the second said group on the transmission output side, each of said groups comprising at least one planetary gear set;
h. variable slip clutch means associated with at least one planetary gear set of said second group and with said output shaft for setting a predetermined maximum torque on said output shaft; and
i. separate means associated with a planetary gear set of said first group and with said input shaft for setting a predetermined maximum torque on said input shaft, whereby pre-stressing of each of said first and second groups is independently adjustable.

4,060,011

ENGINE MOUNTINGS

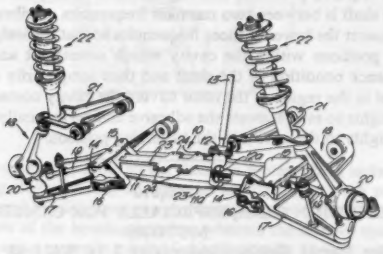
Clive Jones, Coventry, England, assignor to Chrysler United Kingdom Limited, London, England

Filed Dec. 15, 1975, Ser. No. 640,863

Claims priority, application United Kingdom, Dec. 24, 1974, 55693/74

Int. Cl.² B62D *1/20*

U.S. Cl. 74—498 **3 Claims**



1. A steering system and engine mounting assembly for a motor vehicle having an engine comprising:
a. a rack and pinion steering mechanism having a rigid housing with opposing ends and a rack mounted for sliding movement in the housing and having opposing ends;
b. wheel guidance means carried by the ends of the housing and attached to the rack;
c. rack actuating means mounted in the housing and including a pinion engageable with the rack;
d. said housing having an upper side on which the engine is partly supported and having a lower side;
e. webs formed integral with and extending the length of the housing at the upper and lower sides thereof so as to stiffen the housing against bending so that the housing can support the weight of the engine; and
f. means on the housing for mounting the engine thereon and including integral mounting pads formed on the web on the upper side and projecting laterally therefrom.

4,060,012

STEPLESS SPEED CHANGE GEAR FOR MOTOR PROPULSION SYSTEMS OF MOTOR VEHICLES

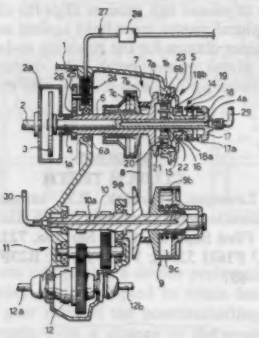
Dante Giacosa, Turin, Italy, assignor to Sira Societa' Industriale Richerche Automotoristiche, Turin, Italy

Filed Apr. 27, 1976, Ser. No. 680,555

Claims priority, application Italy, May 9, 1975, 68183/75

Int. Cl.² F16H *37/00*

U.S. Cl. 74—689 **3 Claims**



1. Stepless speed change gear for monitor propulsion systems of motor vehicles, of the type comprising:
a driving shaft connectible to the motor propulsion system;
a main shaft which receives drive transmission from the driving shaft, and which supports a driving pulley,
a driven shaft which supports a driven pulley;
a V-section endless belt would upon the two pulleys, each pulley being of the type consisting of two plates, with conical surfaces facing each other, one of which plates if fixed to its supporting shaft and the other of which is slidable axially upon its supporting shaft so as to allow corresponding radial movement of the portions of the interposed endless belt between said plates, and
an hydraulic circuit for controlling the position of the slidable plate of each pulley relative to the associated fixed plate and comprising a pump, including an adjustment device through which oil is fed under pressure into respective chambers adjacent to the slidable plates of the respective pulleys,
wherein the improvements consists in:
the main shaft being hollow, and there being mounted coaxially within the main shaft a rotatable drive shaft
a friction clutch at one end of said drive shaft for connecting the latter to the driving shaft, and
a reversing gear at the other end of said drive shaft connecting the latter to the main shaft,
said reversing gear having external control means under which it can assume two extreme operating positions, in the first of which the main shaft rotates in the same direction as the driving shaft, and in the other of which the main shaft rotates in the opposite direction to the driving shaft, and a neutral position in which the main shaft is idle relative to the driving shaft, and wherein the reversing gear comprises, in combination:
a cylindrical shell appendage at the end of the main shaft adjacent the reversing gear,
an epicyclic gear train with cylindrical gears housed in said shell appendage of the main shaft, said train consisting of a toothed ring fixed to the inner wall of the cylindrical shell, a central toothed ring on the driving shaft, a number of toothed planet wheels interposed between and meshing with said toothed rings and the central gear, and a planet carrier structure carrying said planet wheels;
a toothed device consisting of an annular plate, fixed to the planet carrier structure a first externally toothed flange upon the fixed support structure, said first flange being

disposed between the planet carrier structure and the annular plate and facing one side of the latter, a second externally toothed flange fixed to that end of the drive shaft which is adjacent the reversing gear and facing the opposite side of the annular plate from the first flange, and an axially slidable control collar splined to said annular plate and having two sets of teeth or dogs;

the said collar having a first extreme axial position, in which it couples the annular plate with the second flange, and a second extreme axial position in which it couples the annular plate with the first flange.

4,060,013

SKI-RENOVATING OR CONDITIONING TOOL

Arnold M. Thompson, Wheaton, Ill., assignor to Gold Lode, Inc., Wheaton, Ill.

Filed June 11, 1976, Ser. No. 695,128

Int. Cl.[2] A63C *11/06*; B27G *17/04*

U.S. Cl. 76—83 **9 Claims**

1. A ski-renovating or conditioning tool comprising a generally rectangular body having a torque-applying handle thereon, said body being of sufficient length as to straddle and overhang the bottom surface of a ski, a pair of non-circular shaving members depending from the overhanging end regions of the body, pivotally connected to said overhanging end regions for swinging movement about vertical axes, and adapted to condition the side surfaces of the ski when the tool body is manually reciprocated along said bottom surface in screed-like fashion with unidirectional torque being applied thereto oy means of the handle, the effective distance between said shaving members being fixed and appreciably greater than the maximum width of the bottom surface of the ski whereby such application of unidirectional torque to the body will cause said shaving members to follow the contour of said side surfaces with substantially equal pressure during reciprocation of the body in either direction, said shaving members being shaped so as to present spaced apart shaving edges which automatically adjust themselves to the side surfaces of the ski under the influence of the application of unidirectional torque to the tool body.

4,060,014

POWER TONG

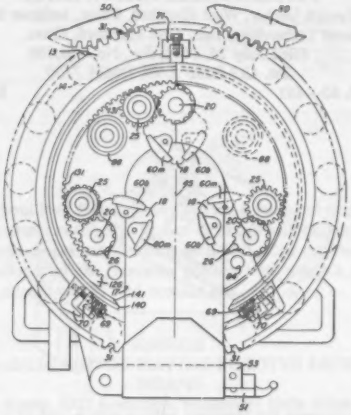
John W. Turner, Jr., Houston, Tex., assignor to Joy Manufacturing Company, Pittsburgh, Pa.

Filed Apr. 29, 1976, Ser. No. 681,654

Int. Cl.[2] B25B *17/00*

U.S. Cl. 81—57.2 **21 Claims**

1. A tong assembly comprising, a housing having an extent with a through opening therein, a plurality of engaging means supported by said housing with each of said engaging means being movable in opposite directions between two positions radially spaced from the central axis of said opening, said engaging means each having portions movable within the extent of said opening intermediate said positions to engage a portion of a member extending axially within said opening, said engaging means being pivotally supported with respect to said housing on axes parallel to and circumferentially spaced with respect to said central axis, said engaging means each having a pair of cam surfaces converging toward an apex spaced laterally outermost from said pivot axis and means carried by said housing for selectively simultaneously moving said engaging means between and into said positions and into engagement



with such a portion of such a member at a third position intermediate said two positions, and said means being operable during such engagement whereby such a member is selectively rotatable in either one of opposite rotational directions with respect to the central axis of such member.

4,060,015

APPARATUS AND METHOD FOR MANUFACTURING RESILIENT BANDS

Chajim Gros, 172, Gladstone Park Gardens, London, N.W. 2 GRL, England

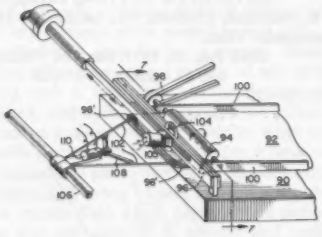
Division of Ser. No. 536,464, Dec. 26, 1974, Pat. No. 3,968,710.

This application Feb. 27, 1976, Ser. No. 662,253

Claims priority, application United Kingdom, Dec. 29, 1973, 60165/73

Int. Cl.[2] B26D *1/18*

U.S. Cl. 83—19 **7 Claims**



1. Apparatus for use in the manufacture of resilient bands comprising means for displacing a tube of resilient material longitudinally towards a cutting station, a band engaging station downstream of said cutting station and comprising at least two spaced fingers for entering the leading end portion of the tube on the egress side of the cutting station, cutting means at the cutting station and movable transversely of the tube to sever the leading end portion of the tube from the remainder of the tube to form a band, means for urging the fingers of the finger arrangement apart to tension the severed band against said fingers, and means for displacing the spread fingers bodily

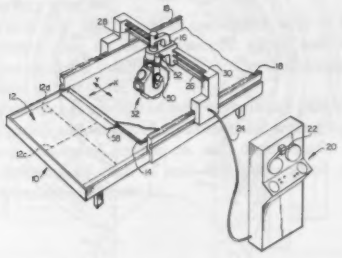
to remove the severed band from said cutting station to clear said cutting station for the next cycle.

4,060,016

METHOD AND APPARATUS FOR BLANKING OUT PATTERN PIECES FROM A LAYUP

Heinz Joseph Gerber, West Hartford, Conn., assignor to Gerber Garment Technology, Inc., East Hartford, Conn.

Filed July 26, 1976, Ser. No. 708,700
Int. Cl.[2] B26F *1/40*; D06H *7/00*
U.S. Cl. 83—451 10 Claims



1. Apparatus for blanking pattern pieces out of a layup of sheet material and comprising:

a. means defining a substantially continuous upwardly facing supporting surface for the sheet layup, said supporting surface being mechanically rigid,

b. means for withdrawing the air from between adjacent sheets in said layup to provide a compacted layup on said supporting surface,

c. a turret having a plurality of faces, and means rotatably supporting said turret for indexing movement on a turret axis,

d. a plurality of blanking dies provided on said turret faces,

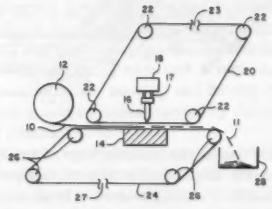
e. means for moving said turret and said turret axis normally relative to said sheet layup supporting surface to move one of said blanking dies through the layup to blank pattern pieces out of said layup, said supporting surface being rigid enough to react the forces imposed thereon by said blanking die as it cuts through the layup and contacts said supporting surface.

4,060,017

METHOD OF CUTTING LITHIUM

John R. Backlund, Chalfont, Pa., assignor to Honeywell Inc., Minneapolis, Minn.

Filed Feb. 18, 1977, Ser. No. 770,180
Int. Cl.[2] B26D *7/06*, *5/08*
U.S. Cl. 83—23 11 Claims



1. A method of cutting lithium metal into a plurality of pieces, comprising the steps of:

positioning a quantity of lithium metal at a predetermined position between an anvil means and a cutting blade means;

interposing a thin flexible film between said blade means and said lithium, said film being inert to said lithium;

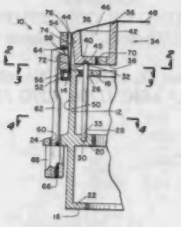
repetitively forcing said blade means toward said anvil means with sufficient force to cut said lithium, and retracting said blades; and indexing said lithium and said film after each cut.

4,060,018

BANJO DRUMHEAD

Donald A. Gilbrech, 1302 Beechwood Ave., Fayetteville, Ark. 72701

Filed Feb. 23, 1976, Ser. No. 660,700
Int. Cl.[2] G10D *1/10*
U.S. Cl. 84—269 9 Claims



1. An improved banjo drumhead comprising:

a circumferential body rim having an upper and lower end;

a plurality of spaced apart elongated cantilevered support columns each affixed at the lower end to said body rim at a point on said body rim below said upper end, and extending above and being spaced from said upper end, each support column being in a plane parallel to the rim axis;

a circumferential tone ring of diameter substantially equal to said body rim, the tone ring having an upper and a lower surface, the lower surface having means engaging the upper end of said support columns whereby said tone ring is supported adjacent to and spaced from said body rim in a plane parallel and coaxial with said body rim upper end, the upper surface of said tone ring being configured to receive a head membrane;

a circular head membrane stretched over said tone ring upper surface; and

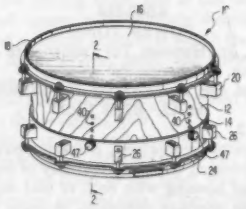
means securing the circumferential periphery of said head membrane to said body rim, said cantilevered support columns permitting vibrational movement of said tone ring relative to said body rim.

4,060,019

ADJUSTABLE DRUM

Charles P. Cordes, 27 Kenneth Place, Clark, N.J. 07066

Filed Aug. 18, 1976, Ser. No. 715,587
Int. Cl.[2] G10D *13/02*
U.S. Cl. 84—411 R 4 Claims



1. An adjustable drum comprising first and second cylindrical shells telescopically disposed relative to each other, each shell having a drum head, means for adjustably securing said drum head to each shell, a plurality of equally spaced apart adjusting means for providing stepwise adjustment between

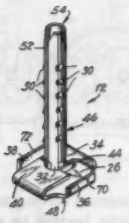
said shells and insulating means associated with each of said adjusting means for insulating said shells from each other while providing a plurality of circumferential gaps between said telescopically disposed shells.

4,060,020

SHEET METAL SCREW

John N. Poliak, East Meadow, N.Y., assignor to Leviton Manufacturing Co., Inc., Little Neck, N.Y.

Filed Sept. 16, 1976, Ser. No. 723,729
Int. Cl.[2] F16B *35/00*
U.S. Cl. 85—1 L 1 Claim



1. A fastener capable of being formed from a blank of sheet material, comprising, in combination: a fastener body comprising a generally tubular shank portion extending substantially about a longitudinal axis from a shank extremity, said shank portion including a plurality of generally cantilevered projection means extending outwardly from said longitudinal axis, each of said projection means including outer bearing surfaces which join substantially helically extending free edges thereof, said shank portion further including a pair of spaced tongue members integral therewith and spaced from one another, said tongue members extending in generally parallel relationship with respect to said longitudinal axis, and head means integral with said shank portion at a disposition opposite said shank extremity for transmitting both linear driving forces substantially parallel to said longitudinal axis and rotating forces about said longitudinal axis to said shank portion, said head means including external bearing surfaces for receiving said linear driving forces and internal opposing bearing surfaces extending substantially perpendicularly with respect to said external bearing surfaces for cooperatively receiving said rotating forces from a first tool inserted within an opening defined by said internal bearing surfaces, said head means further including substantially polygonal external surfaces capable of being engaged by a second rotating tool, said head portion formed by a plurality of 180° bends of sheet material extending from a web interconnecting said shank and head portions to remote surfaces disposed adjacent said tongue members for preventing rotation of said tongue members.

4,060,021

CIRCULAR INDEXING PLATE FOR A MACHINE TOOL

Charles William Berthiez, Lausanne, Switzerland, assignor to Charles William Berthiez, Lausanne, Switzerland

Filed Dec. 12, 1974, Ser. No. 531,878
Claims priority, application France, Dec. 12, 1973, 73.44419
Int. Cl.[2] B23D *7/08;* B23Q *3/10*
U.S. Cl. 90—58 B 9 Claims

1. In a machine tool having a circular indexing plate adapted to support a load, said plate being formed with an upper and lower face, means mounting said plate for rotation about a vertical axis, a plurality of jacks disposed along the periphery of said plate and bearing against portions thereof to support said plate, each of said jacks including a body portion and a movable portion, said movable portion being adjustable vertically, at least between at low end of stroke and a high end of stroke, the stroke of each so disposed jack movable portion in the direction of said plate being capable of exceeding the horizontal position of said plate without load each of said jacks including control means for determining the vertical position of each said movable portion including at least two sets of contacts mounted on each of said jacks, one of said sets being arranged to provide control contact at the level position of said

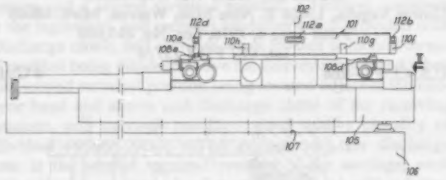


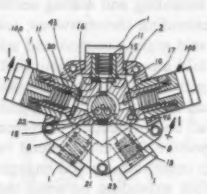
plate without load and the other set being arranged to provide control contact at the high end-of-stroke of said jack movable portion and means mounted on each said jacks responsive to the movement of the movable portion with respect to said body to actuate one of said contact sets.

4,060,022

HYDRAULIC MOTOR HAVING POSITIVE LOCKING MEANS

Philip A. Kubik, 1527 Lochridge, Bloomfield Hills, Mich. 48013

Filed Nov. 10, 1976, Ser. No. 740,596
Int. Cl.[2] F15B *21/02*
U.S. Cl. 91—40 12 Claims



1. A hydraulic motor comprising:
a housing;
a shaft rotatably mounted within said housing;
an eccentric carried by said shaft;
a bearing block carried by said eccentric for relative rotation between said bearing block and said eccentric;
a plurality of hydraulic cylinders grouped about the axis of said shaft in a common plane normal to said axis;
a plurality of pistons each having a passage means, one piston being slideably mounted in each of said cylinders;
means urging each of said pistons in the direction of said bearing block, said cylinder and said piston defining thereinbetween an enclosed pressure chamber when communicated with a source of fluid, generates a force on said piston to extend said piston from said cylinder toward said bearing block and, when closed, said pressure chamber defining a volume fluid which prevents said piston from retracting into said cylinder to prevent said shaft from rotating; said shaft and eccentric having supply and exhaust passages communicating with said bearing block and adapted for connection to a source of fluid pressure and an exhaust means, respectively, and means disposed between said piston and said bearing block for admitting fluid pressure to said pistons in turn, one after the other, during the operation of said motor such that said pistons exert direct thrust on the eccentric to cause rotation of said shaft;
valve means normally operable to permit flow of pressure fluid from said piston to said pressure chamber, said valve means being operable upon actuation to close said fluid

communication and block the flow of fluid from said pressure chamber; and

means for operating said valve means.

4,060,023

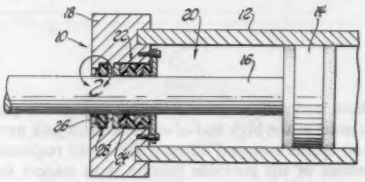
DUAL LIP ROD WIPING SEAL

George Vegella, 13428 E. Nine Mile, Warren, Mich. 48089

Filed June 4, 1976, Ser. No. 693,055

Int. Cl.[2] F16J 15/18

U.S. Cl. 92—168 4 Claims



1. A one-piece self-supporting rod wiping seal member of flexible elastomeric material that can be snap fitted into a retention groove comprising: an endless body portion having a mounting section for mounting the seal member in a supporting groove by flexibly distorting the body portion and snap fitting the mounting section in the supporting groove; and a sealing section extending radially from said mounting section, said body portion having a pair of spaced end walls each extending over both of said mounting and sealing sections and inner and outer side walls extending therebetween; said inner side wall being located on said sealing section and said outer side wall being located on said mounting section; first and second endless lips projecting from one of said end walls at said sealing section; each of said lips having an inner end joined integrally to said one end wall and projecting therefrom to an outer free end with the respective free ends spaced radially from each other; said first lip constituting a rod engaging lip and having an inner side surface extending between the inner and outer ends thereof and projecting from the junction between said inner side and said one end wall axially and radially inwardly in the unstressed condition of said first lip; said first lip having an outer side surface extending between the ends thereof with its inner end located at said one end wall at a location spaced radially outwardly of said inner side wall and radially inwardly of said outer side wall; said second lip consituting a cylinder engaging lip and having an outer side surface extending between the ends thereof with its inner end joined to said one end wall at a location spaced radially outwardly from said first lip and radially inwardly from said outer side wall, said outer side surface of said second lip projecting axially and radially outwardly from said one end wall in the unstressed condition of said second lip; said second lip having an inner side surface extending between the ends thereof with its inner end joined to said one end wall at a location spaced radially inwardly from said outer side surface thereof; said mounting section extending radially outwardly of said second lip with the portion of said one end wall in said mounting section, said outer side wall, and said other end wall constituting mounting groove engaging surfaces of said body for supporting said body in a mounting groove.

4,060,024

DAMPER ASSEMBLY

Arthur M. Deck, Houston, Tex., assignor to Goodman Manufacturing Corporation, Houston, Tex.

Filed Oct. 28, 1976, Ser. No. 736,400

Int. Cl.[2] F24F 7/00

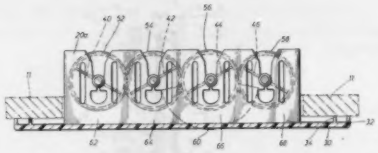
U.S. Cl. 98—40 VM 9 Claims

1. A damper assembly adapted to be installed in a wall or ceiling at the opening of an air duct to control air flow therethrough, which comprises:

a series of generally rectangular blades each having an axis of rotation extending longitudinally substantially centrally of the blade with a journal portion at each end;

means operatively interconnecting said blades for simultaneous rotation on said axes from an open position to a closed position; and

a pair of spaced frame members having blade mounts defined therein in aligned cooperating pairs, each pair of blade mounts receiving the journal portions on one of said blades to mount the same for rotation;



each of said blade mounts having an entry channel defined by opposed surfaces leading to a bearing aperture, said channel narrowing from a width greater than the diameter of said bearing aperture to a width less than the diameter of said bearing aperture at the point of intersection of said channel and said aperture, and at least one relief opening formed adjacent said bearing aperture to permit said opposed surfaces to spread apart as said journal portion is advanced through the channel and snapped into said bearing apertures.

4,060,025

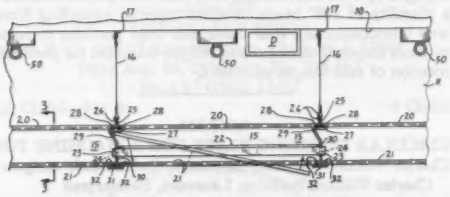
AIR DISTRIBUTION CEILING

Michael H. Pelosi, Jr., 520 Abbott Drive, Broomall, Pa. 19008

Filed Sept. 30, 1976, Ser. No. 728,258

Int. Cl.[2] F24F 7/00

U.S. Cl. 98—40 DL 9 Claims



1. A support member for the panels of an air distribution system comprising a unitary elongated bar having

an upper attaching rib,

an upper horizontally extending portion below said rib with horizontal panel supporting faces therealong,

a lower horizontally extending portion below said upper portion with horizontal panel supporting faces therealong, and

a vertically disposed connecting portion between said horizontally extending portions and having a portion thereof offset to provide a clearance for insertion of the panels from below.

4,060,026

APPARATUS FOR ADDING SALT OR SEASONINGS TO FOOD BEING COOKED IN STEAM COOKERS

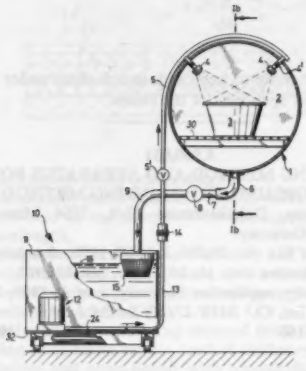
Alfred Löhr, Bochum, and Wolfgang Tschek, Gelsenkirchen, both of Germany, assignors to F. Kuppersbusch & Sohne Aktiengesellschaft, Gelsenkirchen, Germany

Division of Ser. No. 556,174, March 6, 1975, abandoned. This application Nov. 10, 1975, Ser. No. 630,669

Claims priority, application Germany, Mar. 6, 1974, 2410552; Mar. 6, 1974, 7407720[U]

Int. Cl.[2] A47J *27/66*

U.S. Cl. 99—346 5 Claims



1. Apparatus for adding salt or seasonings to food being cooked in a steam cooker cooking vessel having a cooking chamber comprising:

a. a cooking vessel having a support platform and food containers on the support platform for holding the food being cooked;

b. a plurality of spray nozzles at the top of the cooking vessel for spraying the food with a salt or seasoning solution;

c. a separate and portable collecting vessel for accommodating the salt or seasoning solution;

d. a supply line attached to said collecting vessel for connecting said collecting vessel to the spray nozzles of the cooking vessel;

e. a conveying and turnover pump for conveying the salt or seasoning solution from the collecting vessel to the food in the cooking chamber through the supply line; and

f. a discharge line connected to the bottom of the cooking vessel below the support platform and which serves as a return line to the collecting vessel.

4,060,027

APPARATUS FOR APPLYING INGREDIENTS

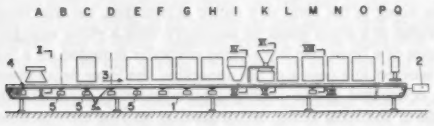
Damian Johann Jenny, Zurich, Switzerland, assignor to Damian J. Jenny AG, Zurich, Switzerland

Filed Dec. 8, 1975, Ser. No. 638,935

Claims priority, application Switzerland, Dec. 16, 1974, 16718/74

Int. Cl.[2] A21C *9/04*; A23P *1/00*; B23Q *7/04*

U.S. Cl. 99—450.1 3 Claims



1. An apparatus for applying ingredients to an edible product, comprising a conveyor band; means for step-wise advancing said conveyor band, at least one work station arranged along the conveyor band for the application of at least one type of ingredient to the edible product, a carriage, means mounting the carriage to be movable transversely with respect to the direction of movement of the conveyor band, means for displacing the carriage transversely with respect to the direction of movement of the conveyor band between a first terminal position and a second terminal position, a receiver container for the ingredient, said receiver container being provided with a discharge chute, said carriage when located in its first terminal position being disposed above the conveyor band and when in its second terminal position being located adjacent the conveyor band and above said discharge chute of the receiving container, said carriage being provided with a plurality of individual suction heads which engage with the discharge chute in the second terminal position of the carriage, each suction head comprises a head portion equipped with substantially parallel bores, means defining a vacuum compartment flow communicating with said substantially parallel bores, a piston displaceable in the carriage provided substantially coaxially with respect to each head portion, said piston having a leading end provided with pins which engage into said bores when the piston assumes a lower terminal position for closing said bores, said piston being movable into an upper terminal position where said bores are freed.

4,060,028

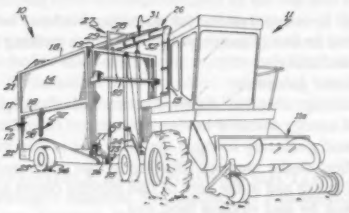
STACK FORMING VEHICLE

Gene A. Luscombe, Dolliver, Iowa 50531

Filed Aug. 2, 1976, Ser. No. 711,107

Int. Cl.[2] B30B *3/02*; B60P *1/32*

U.S. Cl. 100—100 6 Claims



1. A stack forming vehicle adapted to be towed by a prime mover and adapted to receive a chopped forage crop from a crop harvesting device of the type having a discharge spout through which the chopped forage crop is discharged, comprising:

a generally rectangular shaped vehicle body including a bottom wall, a front wall, upstanding substantially opposed vertical sidewalls, a closure structure shiftably mounted on said vehicle body adjacent the rear end thereof and being swingable between a closed position for closing the rear end of the vehicle body, and an open position to permit a formed stacked to be removed rearwardly from the vehicle body,

ground-engaging wheels connected with said vehicle body to permit the latter to travel over the surface of the ground,

a revolvable compacting roller mechanism positioned within said body and being operable to continuously travel over the surface of the forage crop during the loading of the vehicle body to continuously compact the forage crop therein,

a vertical pusher member positioned in upstanding substantially vertical relation within the body and being longitudinally shiftable between a forward position adjacent the front wall of the body and a rearward position adjacent the rear of the body whereby said pusher member will progressively push the form stacked rearwardly from the wagon, when shifted from the forward position to the rearward position,

drive means connected with the said pusher member and to a source of power and being operable to shift said pusher member between said forward position and said rearward position,

said drive means being operatively connected with said ground engaging wheels and being operable to drive said wheels in a forwardly direction simultaneously as the pusher member is being shifted rearwardly.

4,060,029

BOUNCE-FREE OBJECT ARRESTING SYSTEM

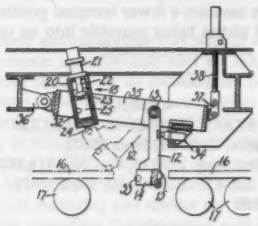
Robert Marshall, Sheffield, England, assignor to Davy-Loewy Limited, Sheffield, England

Filed June 24, 1976, Ser. No. 699,327

Claims priority, application United Kingdom, June 24, 1975, 26791/75

Int. Cl.[2] B21B *45/00*; B44B *5/00*

U.S. Cl. 101—4 9 Claims



1. An arresting system for arresting without substantial bounce an arcuately moving object having a striking face, the system including:

a. a linear guideway;

b. an energy absorber disposed at one end of said guideway;

c. said energy absorber having a piston rod extending axially of said guideway towards the other end of said guideway;

d. a first elastic element disposed at the other end of said guideway and in the path of said moving object so as to be struck by said striking face; and

e. a second elastic element which is a close sliding fit within said guideway between said piston rod and said first elastic element, and which is normally in contact with said first element until said first element is struck by said striking face,

f. the coefficients of restitution between said first and second elements and between said striking face and said first element being high, whereby the kinetic energy of said moving object is transferred to said second element and thence to said energy absorber without substantial movement of said first element.

4,060,030

STENCIL SHEET HOLDER

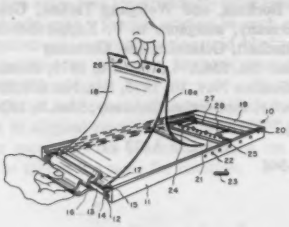
Fred J. Noschese, 74 Gavin St., Yonkers, N.Y. 10701

Filed July 28, 1975, Ser. No. 599,606

Int. Cl.[2] B41F *15/36*

U.S. Cl. 101—127.1 8 Claims

1. A stencil-sheet holder assembly comprising, a rigid frame having peripheral leg members that define a central open area, said peripheral leg members including two rigid non-flexible longitudinally extending parallel leg members, clamping means located near one end of said frame for securing one end of a stencil-sheet to said one end of the frame, a cross-bar support means movably mounted to the other end of the frame and having means for securing the stencil-sheet thereto, means for longitudinally adjusting the position of the cross-bar support means, and spring tensioning means secured to the cross-bar support means and the position adjusting means so as to urge the cross-bar support means in the direction of said other end



of the frame thereby to support a stencil-sheet under tension over the central open area of the frame.

4,060,031

PRINTING METHOD AND APPARATUS FOR PERFORMING THE PRINTING METHOD

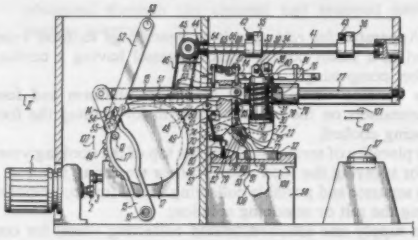
Wilfried Philipp, Daimlerstrasse 27/1, 7254 Munchingen-Kallenberg, Germany

Continuation of Ser. No. 59,056, July 29, 1970, abandoned. This application Oct. 16, 1973, Ser. No. 406,901

Claims priority, application Germany, Aug. 2, 1969, 1939437

Int. Cl.[2] B41F *17/00*; B41M *1/14*

U.S. Cl. 101—163 19 Claims



1. Apparatus for printing materials comprising a table for an ink container, a matrix, a print carrier, a brush for inking the matrix, a doctor blade and at least one printing pad having an ink repellent surface which permits ink to adhere thereto when the pad is pressed onto the matrix with a predetermined pressure, the printing pad being disposed on a plunger and arranged for movement between the matrix and the print carrier which is spaced therefrom, the printing pad having a rest position arranged above at least one of the matrix and the print carrier and being movable in the direction of one of the matrix and the print carrier for contact therewith, the brush and the doctor blade being arranged for movement over and engagement with the matrix, at least one of the plunger and the brush and the doctor blade being secured to movable carriages disposed in a guide means, and means connecting said brush, said doctor blade and said plunger via said carriages to a common drive for coordinating the movements thereof, said common drive being in the form of a motor driven disc, the disc being provided at a point about its periphery with a roller engaging a guide of a lever, the lever being pivotally mounted on a first pin secured to a casing of the apparatus, the lever being pivotally connected to the carriages by connecting members, the guide of the lever being constructed at its two ends as a slot guide and having in its central portion an outwardly extending bulge constituting a portion of the periphery of a circle along the circumference of which the roller of the disc travels during a portion of its movement so as to maintain the printing pad in

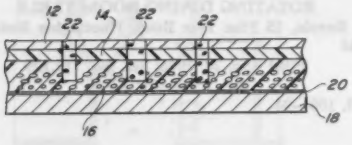
contact with one of the matrix and the print carrier for a predetermined period.

4,060,032

SUBSTRATE FOR COMPOSITE PRINTING AND RELIEF PLATE

Charles P. Evans, Trumbul, Conn., assignor to Laser Graphic Systems Corporation, Sudbury, Mass.

Continuation of Ser. No. 579,741, May 21, 1975, abandoned.
This application Oct. 27, 1976, Ser. No. 736,026
Int. Cl.[2] B41N 1/12
U.S. Cl. 101—401.1 5 Claims



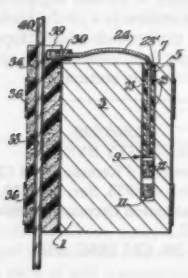
1. A composite plate, comprising:
a dimensionally stable cellular polymer substrate selectively removable on exposure to a developing radiation of first wavelength,
a writing layer overlying the surface of said substrate selectively removable on exposure to a writing radiation of second wavelength but not removable on exposure to said developing radiation, and
said polymer substrate being selected from the group consisting of cellulose nitrate, methyl methacrylate and ethyl cellulose and cross-linked with trimethylol propane trimethacrylate.

4,060,033

DELAY BOOSTER ASSEMBLY

Constantine Postupack, Tamaqua, Pa.; David G. Borg, Sagamore Hills, Ohio; Norman M. Junk, Ringgold, Pa.; Gerald L. Oswald, and Arthur F. Bowman, both of Tamaqua, Pa., assignors to Atlas Powder Company, Dallas, Tex.

Filed Mar. 9, 1976, Ser. No. 665,297
Int. Cl.[2] F42B 3/10
U.S. Cl. 102—24 R 4 Claims



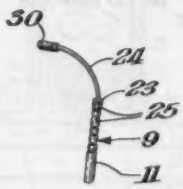
1. A delay booster assembly comprising a booster shell, explosive material in said shell, a cap well extending through an end wall of the booster shell and into the explosive material in said shell, a nonelectric delay cap inserted in the cap well, said cap being open at its outermost end and having explosive material and a delay material located in the innermost end portion of the cap, a plug for sealing off the open end of the cap, a passageway in the plug, a passive signal carrier in the form of an empty open ended tube extending from a point externally of the cap into the open end of said cap, a sensor element attached to that end of the empty tube signal carrier extending externally of the booster shell, said end of said empty tube signal carrier being in open and direct communication with the sensor with the other end of said open tube being in open and direct communication with the open end of said cap, and a shock absorbing detonating cord tunnel member forming a part of the booster assembly through which tunnel a detonating cord can be passed, said sensor being so positioned with respect to said detonating cord that it lies adjacent to said cord.

4,060,034

DELAY BOOSTER ASSEMBLY

Arthur F. Bowman, and Francis J. Camerini, both of Tamaqua, Pa., assignors to Atlas Powder Company, Dallas, Tex.

Filed Mar. 9, 1976, Ser. No. 665,298
Int. Cl.[2] F42B 3/10
U.S. Cl. 102—24 R 3 Claims



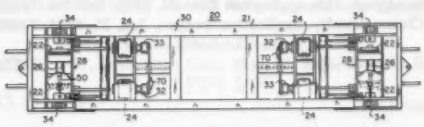
1. A delay insert assembly for initiating a booster explosive in response to the detonation of detonating means comprising a nonelectric cap which is open at one end and has explosive material and a delay material located in the opposite end of the cap, a passive signal carrier in the form of an empty open ended tube extending from a point externally of the cap into the open end of said cap, and a sensor attached to that end of the signal carrier extending externally of the cap, said end of said empty tube attached to said sensor being in open and direct communication with the sensor with the other end of said tube being in open and direct communication with the open end of said cap.

4,060,035

CONVERTIBLE RAIL-HIGHWAY SHUTTLE CAR

Jon R. Swoager, Imperial, Pa., assignor to Automation Equipment, Inc., Imperial, Pa.

Filed June 26, 1975, Ser. No. 590,412
Int. Cl.[2] B61C 11/00, 13/00; B61F 13/00; B62D 61/12
U.S. Cl. 105—177 18 Claims



1. A shuttle car, for transporting massive loads, movable on a road bed and a rail bed comprising:
an elongated main frame;
a pair of movable truck assemblies spaced apart and movably supported from said elongated main frame;
a pair of flanged rail wheels supported from each truck assembly for rotation about an axis perpendicular to the longitudinal axis of said elongated main frame;
a plurality of smooth solid resilient wheels supported from said elongated main frame for rotary movement about axes fixed with respect to said elongated main frame which axes are parallel to the longitudinal axis of said elongated main frame;
drive means connected to said plurality of smooth solid resilient wheels for driving all of said plurality of smooth solid resilient wheels when activated; and,

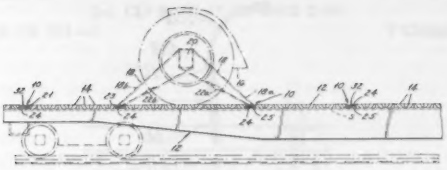
positioning means for moving said pair of truck assemblies between a first position wherein said flanged rail wheels are lower than said plurality of smooth solid resilient wheels, fully supporting said frame, and a second position wherein said plurality of smooth solid resilient wheels are lower than said flanged rail wheels, fully supporting said frame, and a second position wherein said plurality of smooth solid resilient wheels are lower than said flanged rail wheels, fully supporting said frame, for moving the shuttle car in a direction transverse to its longitudinal axis.

4,060,036

ANCHORED TRANSPORTATION DEVICE

Joseph X. Palms, 80 Lakeshore, Grosse Pointe, Mich. 48230

Filed Sept. 13, 1976, Ser. No. 722,807
Int. Cl.² B60P *7/08*
U.S. Cl. 105—368 T **3 Claims**



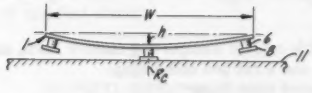
1. In a railway flatbed car or the like:
a generally rectangular flat lading supporting surface formed of a plurality of juxtaposed wooden timbers,
a plurality of elongated upwardly opening channels arranged in parallel spaced apart relation and disposed in spaces between said timbers and extending substantially coextensively with the length thereof,
a plurality of transversely extending webs secured in each channel and spaced apart therein,
and a rod-like anchor disposed substantially within each channel and spaced from the bottom and walls thereof and secured to said webs, said web members being provided with through apertures adjacent the rod-like anchor for receiving therethrough tie-down means.

4,060,037

PALLET

Hans Hjalmar Gustafsson, 22 Tradgardsgatan, S-172 38 Sundbyberg, Sweden

Continuation-in-part of Ser. No. 539,942, Jan. 10, 1975, abandoned. This application Dec. 16, 1976, Ser. No. 751,034
Claims priority, application Sweden, Jan. 21, 1974, 7400759
Int. Cl.² B65D *19/00*
U.S. Cl. 108—51.1 **5 Claims**



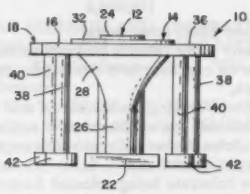
1. A pallet including:
a rectangular load carrying deck of generally uniform thickness formed of several sheets of flexible wooden material having spring characteristics, the sheets being superimposed upon one another and formed to be upwardly concave about a single axis and glued together so as to constitute an upwardly concave structure substantially free from inherent tension forces in its unloaded condition and having sufficient elasticity to assume a substantially planar form under load, and supporting means attached to the under convex side of said deck,
said supporting means being arranged in a plurality of parallel rows extending in the direction of the axis of curvature of the deck, one of said rows being located in a plane intersecting the axis and a line on the deck substantially corresponding to a transverse center deck line, a second row extending along a first outer edge portion of the deck and a third row extending along a second outer edge portion of the deck, the supporting means being of the same height so that all of the supporting means cannot touch a supporting surface for the pallet in the unloaded condition thereof but will allow the deck to assume a planar shape with all of the supporting means in contact with the supporting surface under load.

4,060,038

ROTATING DINING ROOM TABLE

Sylvia Ruvolo, 15 Pine Tree Road, Huntington Station, N.Y. 11746

Filed Aug. 24, 1976, Ser. No. 717,129
Int. Cl.² A47B *57/00*
U.S. Cl. 108—94 **4 Claims**



1. A rotatable dining room table comprising:
a pedestal,
a relatively fixed inner section supported on said pedestal, said inner section having an upper support surface for a centerpiece,
an intermediate serving section rotatably mounted on said pedestal in concentric relation to said inner section, said intermediate section having an upper support surface concentrically disposed relative to the upper support surface on said inner section, and
an outer dining section supported in concentric relation to said inner and intermediate sections, said outer section including a plurality of arcuate segments arranged about said intermediate section in a circle, each segment having a planar support surface individually supported, on a pair of vertical support legs, adjacent the upper support surface of said intermediate sections.

4,060,039

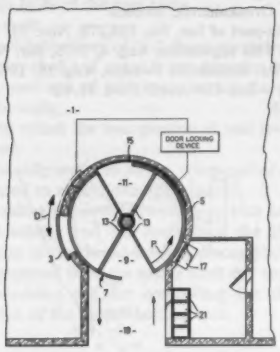
SECURITY SYSTEM

Serge Lagarrigue, Domaine d'Escosse, F 78 Chevreuse, France

Filed June 4, 1975, Ser. No. 583,725
Claims priority, application Germany, June 6, 1974, 2427359; May 6, 1975, 2520077
Int. Cl.² E05G *5/02*
U.S. Cl. 109—3 **6 Claims**

1. A security system for the outer area of a room comprising a bullet-proof revolving door having a circular outer wall with an opening therein leading into the room and an exit, a movable door movable along said outer wall to close said opening, a release device and means for locking the movable door in combination with said release device, said release device being a weapon detector which is positioned in the region of the revolving door outside the room, the movable door forming part of a bullet-proof surrounding of said revolving door divided by bullet-proof partition walls forming plural compartments of a first type separated by plural compartment of a second type, said compartments of said first type including an exit passage and said compartments of said second type having no exit passage, only one of said compartments of said first type

being adjacent said movable door at a given time, said walls being situated outside the room, said weapon detector being



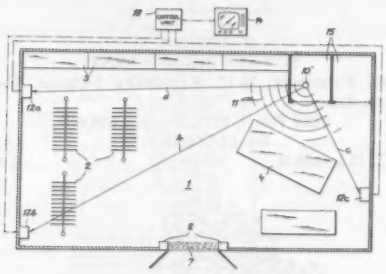
disposed in an area situated in front of the movable door as seen in the revolving direction of the door.

4,060,040

ANTITHEFT SYSTEM FOR SALES AREAS

Friedrich Karl Johnssen, Kieferhalde 23, Essen, Germany (4300)

Filed Apr. 30, 1976, Ser. No. 682,032
Claims priority, application Germany, May 3, 1975, 2519799
Int. Cl.² G08B *13/00*; E05G *1/10*
U.S. Cl. 109—40 **9 Claims**



1. An antishoplifting system for protecting a premises against theft of goods therefrom, comprising:

a plurality of signal transmitters affixed to respective articles of said goods, each of said transmitters comprising:

a housing,

a first, continuously effective, signal emitter in said housing,

a second, stored-energy, triggerable signal emitter in said housing, and

means on said housing for triggering said second emitter upon the removal of the transmitter from the respective article;

means responsive to said first signal emitter for signaling the removal of an article carrying the transmitter thereof from the premises; and

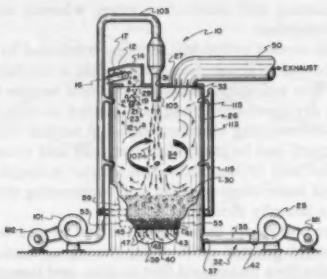
means responsive to a signal from said second emitter upon the triggering thereof for localizing the source of said signal on said premises.

4,060,041

LOW POLLUTION INCINERATION OF SOLID WASTE

Norman K. Sowards, Coeur d'Alene, Idaho, assignor to Energy Products of Idaho, Coeur d'Alene, Idaho

Filed June 30, 1975, Ser. No. 591,556
Int. Cl.² F23G *5/00*
U.S. Cl. 110—8 F **8 Claims**



1. A method of low pollution eliminating of solid particles vaporized during incineration, the steps of:

elevating the temperature of a confined fluidized bed in an order of magnitude capable of supporting combustion;

continuously causing pieces of solid waste to become embedded within the confined fluidized bed;

impinging influent air centrally downward against the fluidized bed within the confinement;

combusting the solid waste within the fluidized bed and volatizing the volatile matter contained within the solid waste into the vapor space between the top of the fluidized bed and the top of the confinement;

after-burning the volatile matter in the vapor space extending substantially above the fluidized bed;

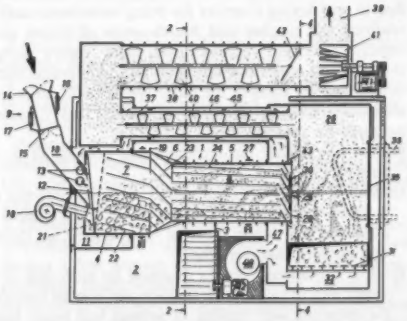
causing an annulus of air to be vortically circulated around the impinging influent air throughout substantially the entirety of the vapor space within the confinement to increase residence time, prevent channeling and centrifuging airborn solid particles causing at least some of said particles to return to the bed by force of gravity.

4,060,042

INCINERATOR

Enzo Baraldi, and Giuliano Longhi, both of Bologna, Italy, assignors to Fire Victor Holding S.A., Luxembourg, Luxembourg

Filed May 12, 1976, Ser. No. 685,911
Claims priority, application Italy, May 17, 1975, 6488/75
Int. Cl.² F23G *5/06*
U.S. Cl. 110—14 **16 Claims**



1. An incinerator comprising a rotary furnace of highly heat

resistant steal, having a horizontal axis of rotation and comprising a drying chamber and an incinerating chamber; drive means for rotating said furnace; charging means for feeding refuse to said drying chamber; a burner projecting into said drying chamber; afterburner means for recombusting any incompletely burned refuse leaving said incinerating chamber and for ridding combustion gases of solids; means for supplying preheated comburent air to said furnace; and means for cooling and exhausting said combustion gases; wherein said furnace further comprises:

first and second cylindrical sections connected by a hollow, frustoconical connecting piece which is shorter than both said first and second sections, said first section containing said drying chamber and said second section containing said incinerating chamber, said first section being shorter in length and larger in diameter than said second section so that said drying chamber is shorter in length and has a larger inside diameter than said incinerating chamber and has a laterally closed-off portion;

a refuse entry gate disposed at the end of said first section remote from said section and having an inside diameter smaller than that of said first section, said laterally closed-off portion of said drying chamber being situated below the level of said entry gate and said incinerating chamber for preventing liquid refuse from flowing out of said drying chamber;

a slag and cinder outlet opening disposed at the end of said second section remote from said first section;

a screw conveyor disposed on that portion of the inside wall of said drying chamber nearest said entry gate;

a first series of conveyor blades disposed on the remainder of said inside wall of said drying chamber;

a second series of conveyor blades disposed on the inside wall of said connecting piece;

a third series of conveyor blades disposed on the inside wall of said incinerating chamber from the junction thereof with said connecting piece to the vicinity of said outlet opening; and

a fourth series of conveyor blades disposed immediately adjacent to said outlet opening, said blades of said first series having an angle of pitch, relative to said axis of rotation, which is greater than that of said third series but less than that of said second and fourth series, and said blades of said second series having an angle of pitch, relative to said axis of rotation, which is less than that of said fourth series, said refuse thereby being rapidly carried away from the region of said entry gate by said screw conveyor upon rotation of said furnace, then moved relatively slowly through said drying chamber by said first series of blades for the purpose of drying and pre-heating, thereafter transported relatively quickly through said connecting piece into said incinerating chamber by said second series of blades, and moved on by said third series of blades within said incinerating chamber more slowly than in said drying chamber for being incinerated until the resultant ash reaches said fourth series of blades and is rapidly removed thereby from said rotary furnace through said outlet opening; and said incinerator further comprising for cooling the outer wall of said furnace:

a stationary cooling chamber in which said furnace is mounted for rotation,

at least one pusher fan for supplying cooling air to said cooling chamber,

adjustable air-flow control means disposed between said at least one pusher fan and said cooling chamber for adjusting the rate of flow of said cooling air through said cooling chamber, and

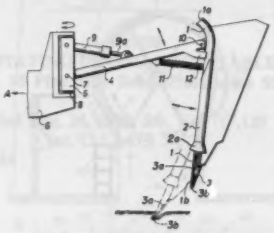
air-flow chanelling screens disposed on each side of the upper half of said rotary furnace and spaced therefrom for directing said cooling air around said upper half of said furnace, said screens defining an elongated opening above said furnace for the excape of said cooling air from said cooling chamber.

4,060,043

DIGGING AND PLANTING MACHINE

Stig-Gunnar Lofgren, Jarved, Sweden, assignor to Mo och Domsjo AB, Ornskoldsvik, Sweden

Continuation-in-part of Ser. No. 526,278, Nov. 22, 1974, Pat. No. 3,998,171. This application Aug. 4, 1975, Ser. No. 601,557
Claims priority, application Sweden, Aug. 15, 1974, 7410431
Int. Cl.[2] A01C *5/04, 11/02*
U.S. Cl. 111—3 **14 Claims**



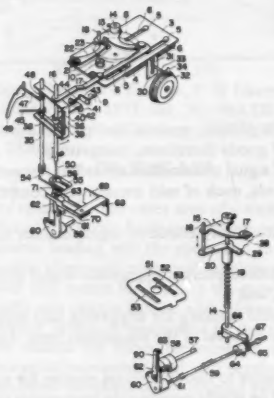
1. A digging and planting machine comprising a digging and planting tool including a tubular member movable between a lower position partially embedded in the ground and an upper position above the ground, said tubular member having a lower open digging and planting tip end; closure means mounted solely on the outside of said tubular member and solely for slidable reciprocable movement along the exterior to the digging and planting tool and across said open tip end between a first position completely closing off the open end and preventing entry of dirt thereinto, for digging a hole, and a second position exposing the entire open end for delivery of a plant through the open end of said tubular member into the hole; and means slidable reciprocably between a ground-contacting position and an elevated position for compacting earth around the plant after planting.

4,060,044

TOY SEWING MACHINE

Shigeaki Kuramochi, 24-17, Koishikawa 5-Chome, Bunkyo, Tokyo, Japan

Filed Feb. 9, 1976, Ser. No. 656,640
Int. Cl.[2] D05B *3/02*
U.S. Cl. 112—158 R **1 Claim**



1. A toy sewing machine comprising:

a rotary cam shaft associated with a rotary rod for moving a needle-holding rod having a needle thereon in the upper and lower directions;

a cam body comprising a plurality of overlapping cams

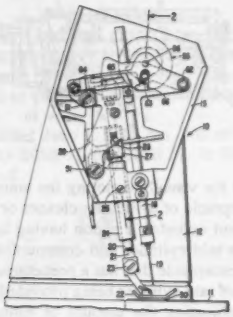
having plural cam faces at the periphery thereof and supported by the cam shaft;
a vertically movable pin arranged to engage with any one of the cam faces of the cam body;
a rotary shaft;
a freely rotatable lever of "L" shape pivotally supported by the rotary shaft and urged in one direction by a torsion bar spring, one end of said lever having the pin penetrated therethrough;
a frame to which the base portion of said lever is pivotally attached;
a link pivotally attached to the other end of said lever and connected to a needle-holding rod;
thread-holding pieces for cooperation with said needle;
a thread-holding rod for controlling the thread holding operation of the thread-holding pieces; and
an arm projected from the rotary shaft and connected to the thread-holding rod for controlling the thread holding operation of the thread-holding rod.

4,060,045

PRESSER BAR PRESSURE REGULATING MODULE

Erwin Vahle, Stutensee, and Arnold Hartig, Karlsruhe, both of Germany, assignors to The Singer Company, New York, N.Y.

Filed May 26, 1976, Ser. No. 690,125
Int. Cl.[2] D05B *29/02*
U.S. Cl. 112—235 **2 Claims**



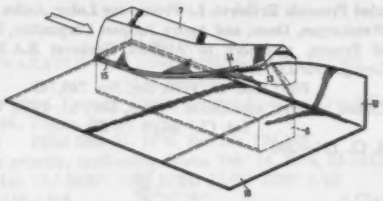
1. A pressure regulating module for a sewing machine having a presser bar with an axial bore on one end and adapted to have a presser foot secured to the other and thereof, a bearing endwise shiftably supporting the presser bar in the sewing machine, a compression spring for biasing said presser bar endwise carried within said axial bore, an abutment member received in said axial bore in engagement with said compression spring and protruding from said presser bar in an enlarged right circular platform, said module comprising: a support bracket, fastenings for detachably securing said support bracket to said sewing machine in a predetermined position with respect to said presser bar, a cam shiftably supported on said support bracket, a cam follower mechanism shiftably supported on said support bracket and arranged in cooperative engagement with said cam, said cam follower mechanism having a portion thereof of spherical surface form in axial engagement with said right circular platform of said abutment member.

4,060,046

HAND TOOL

Gerd-Jurgen Eckold, Silberhutte 11, D 3424 St. Andreasberg, and Hans Maass, Germelmannstr. 12, D 3422 Bad Lauterberg, both of Germany

Filed Jan. 30, 1976, Ser. No. 653,883
Int. Cl.[2] B21D *19/02, 39/02*
U.S. Cl. 113—54 R **13 Claims**



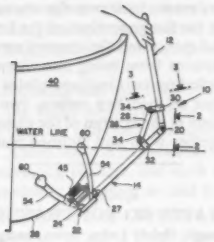
1. A power-operable hand tool for folding back upright flange portions at the edges of sheet material, which comprises a support jaw having a main pressing surface for supporting the underside of the sheet material during said folding, an operative jaw pivotally mounted about an axis extending parallel to the main pressing surface of the support jaw, drive means for causing operative pivoting of said operative jaw, said drive means being connectable to a source of motive power therefor, wherein the operative jaw includes a main pressing surface portion at one end of the operative jaw and a recessed surface portion at the other end of the jaw, the recessed surface portion having at its periphery a lug portion capable of engaging over the edge of the upright flange portion to be folded back.

4,060,047

DEVICE FOR CLEANING BOTTOM OF A BOAT

Barney Sabella, 7940 Lankershim Ave., Highland, Calif. 92346

Filed Aug. 24, 1976, Ser. No. 717,117
Int. Cl.[2] B63B *39/00, 43/02*
U.S. Cl. 114—222 **6 Claims**



1. A device for cleaning the bottom of a boat while the boat is afloat, the device comprising:
a. a first and second rod member, said first rod member pivotally mounted at a first end portion to a first end portion of said second rod member;
b. cleaning means having a scrubbing face rotatably mounted to a second end portion of said second rod member, said cleaning means rotatable about the longitudinal axis of said second rod member;
c. a plurality of flexible stabilizing members independently disposed about the cleaning means, each of said members having a first portion affixed to said cleaning means and divergent cantilevered second portions extending in the direction of and beyond said scrubbing face and adapted to cooperate with the contour of the boat for further aligning said scrubbing thereof; and

d. means for adjustably clamping said first rod member to a desired angular position with respect to said second rod member to enable the positioning of said scrubbing face of said cleaning means against a surface of the bottom of the boat.

4,060,048

MECHANICAL COUPLINGS FOR PONTOONS AND SIMILAR FLOATABLE UNITS

Michel Francois Bréhéret, Le Fresne sur Loire; Andre Raphael Wambergue, Daon, and Andre Jacques Carpentier, Paris, all of France, assignors to Ateliers Breheret S.A.R.L., St. Georges-sur-Loire, France

Filed Dec. 13, 1976, Ser. No. 749,765
Claims priority, application France, Dec. 19, 1975, 75.39894
Int. Cl.[2] B63B *35/38*
U.S. Cl. 114—266 8 Claims

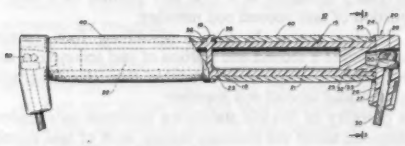
1. A joining device for use in connecting together buoyant members, such as pontoons, to make a buoyant structure, said joining device comprising channel means on each of said buoyant members, I shaped section key means for cooperating with said channel means on each of said buoyant members to connect said buoyant members together, said I shaped section including spaced apart flange sections separated by a web section, said channel means defining a slot in which the web sections of the key means locates in the assembled condition of the device so that the flange sections of the key means lie in the respective channel means and the channel means are prevented by said flange sections from being moved apart, and said key means further including two inclined plates at the bottom of the flange sections of said key means, two trapezoidal half wedges respectively at the bottom of the channels for engaging and wedging together with said inclined plates.

4,060,049

WATER SKI ROPE HANDLE

James T. Rumbaugh, Spirit Lake, Iowa, assignor to Berkley & Company, Inc., Spirit Lake, Iowa

Filed Oct. 28, 1976, Ser. No. 736,426
Int. Cl.[2] A63C *11/10*
U.S. Cl. 115—6.1 7 Claims



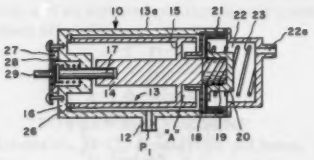
1. A water ski rope handle comprising: a cylindrical handle portion having a pair of hollow recesses therein and extending from opposite ends of the same, a pair of rope anchoring flanges mounted on the ends of the cylindrical handle portion, said flanges having ski rope anchoring portions and plug portions with the plug portions extending translationally from the achoring portions and being positioned into the recesses in the ends of cylindrical handle portion closing the same to define floatation cavities therein and mounting the flanges on the handle portion, said rope anchoring portions each having an aperture formed therein extending therethrough to the plug portion terminating in an exposed recess therein, said flanges being adapted to receive the ends of the tow rope to extend through the apertures in the rope anchoring portions with the rope being secured by knots at the ends of the same located in the exposed recesses of the rope anchoring the flanges, said rope anchoring flanges being inclined to the extent of the cylindrical portion by approximately 75°

4,060,050

FILL INDICATOR FOR A VACUUM CLEANER DUST COLLECTOR

Sven Bertil Simonsson, Tyreso, Sweden, assignor to Aktiebolaget Electrolux, Stockholm, Sweden

Filed Aug. 18, 1976, Ser. No. 715,303
Claims priority, application Sweden, Aug. 29, 1975, 7509600
Int. Cl.[2] G01P *13/08*; G01L *7/16*
U.S. Cl. 116—114 AD 5 Claims



1. An indicator for visually denoting the amount of dust or dirt in a dust receptacle of a vacuum cleaner or the like comprising: a trasparent cylinder, a piston having indicia is rotatably journalled in said cylinder and communicating with the inlet of said dust receptacle that has a predetermined pressure, the outer surface of said cylinder being provided with marking for continually indicating the amount of filling of the dust collector, said piston being provided with a central shaft having a threaded end projecting from the forward end of said piston, a nut adapted to be screw-connected to said threaded end, and a diaphragm communicating with the outlet of said dust receptacle and fixed to said nut, the pressure difference between the inlet and outlet of said dust receptacle causing said diaphragm to effect a translating movement which causes the threaded shaft of said piston to turn within said nut thereby rotating said piston in said cylinder, a latching means on said piston and cylinder which co-acts to retain said piston in the position it has assumed in the cyliner due to said pressure difference, said latching means including a first row of teeth at the end of the piston remote from said diaphragm, a spring engaging said nut on the opposite side from the diaphragm and biasing said piston rearwardly towards said first row of teeth, and a second row of teeth on a surface of said cylinder facing said first row of teeth, said spring urging said first and second row of teeth into latching engagement when said vacuum cleaner is inoperative.

V964/5 N029 77 UMI

4,060,051

INDICATOR SIMULATING A SEVEN-SEGMENT READOUT DEVICE

Alarico A. Valdettaro, Bloomington, Ind., assignor to Sarkes Tarzian, Inc., Bloomington, Ind.

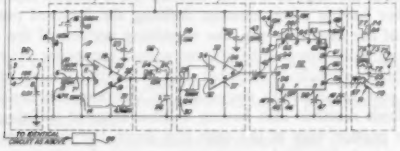
Filed Feb. 17, 1976, Ser. No. 658,706
Int. Cl.[2] H03J *1/04*
U.S. Cl. 116—124.1 A 8 Claims

1. A simulated seven-segment display comprising:
a mask having a viewing aperture defined therein;
a film strip having a plurality of numeric characters disposed thereon, each of said numeric characters having a segmented type font wherein each numeric character is formed from one or more of a predetermined number of possible segments arranged to consistently simulate a predetermined type of seven-segment digital display as the film strip is incrementally advanced, said predetermined possible segments comprising at least three substantially parallel horizontal segments spaced substantially vertically from each other, and at least four substantially vertical segments grouped in two spaced groups, each group containing two spaced, substantially coaxial segments, the segments of one of the groups being substantially parallel to the segments forming the other group, with the substantially horizontal segments being interposed between the two groups; and
means for advancing said film strip past said aperture sequentially to align predetermined ones of said numeric characters with said aperture for viewing therethrough.

4,060,052

COATING APPARATUS CONTROL INCLUDING TIME DEPENDENT INHIBITOR CIRCUIT

Harvey R. Algeri, North Olmsted, and William C. Stumphauzer, Elyria, both of Ohio, assignors to Nordson Corporation, Amherst, Ohio

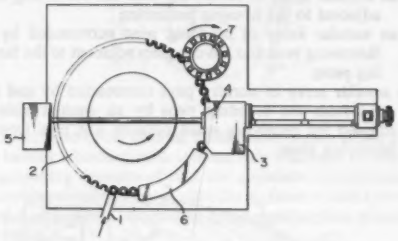
Filed June 1, 1976, Ser. No. 691,820
Int. Cl.[2] B05B *15/00*; G05B *11/16*; H03K *19/00*
U.S. Cl. 118—2 9 Claims

1. A system for automatically treating articles comprising:
a conveyor which conveys the articles to be treated into and out of a predetermined treating position, and which translationally stops said articles in said treating position for a predetermined period of dwell time sufficient to treat said articles;
a sensor positioned to sense articles in said treating position having an output which is in a first state when no article is sensed, and in a second state when an article is sensed;
a time dependent inhibitor having a control input functionally connected to the output of the sensor and an output which remains in a first state until said sensor output has remained in its second state for a predetermined time period, and which inhibitor output changes to a second state after said period has elapsed;
means to rapidly reset the timing period when said sensor output has changed to its first state from its second state;
an article treatment apparatus having a control input functionally connected to said inhibitor output, and which apparatus is activated in response to said second state of said inhibitor output.

4,060,053

APPARATUS FOR DISPENSING CAP LINING MATERIAL

Hidehiko Ohmi, Komaki, Japan, assignor to Japan Crown Cork Co., Ltd., Tokyo, Japan

Filed Oct. 27, 1976, Ser. No. 736,185
Claims priority, application Japan, Feb. 16, 1976, 51-14824
Int. Cl.[2] B05C *7/00*; B29D *31/00*; B29F *3/00*
U.S. Cl. 118—215 4 Claims



1. An apparatus for dispensing predetermined amounts of lining material into cap shells, said apparatus comprising:
conveyor means including a passage for conveying cap shells at predetermined speeds;
extruder means provided above and along the shell-conveying passage for extruding a predetermined quantity of a lining material through a discharge passage into each cap shell;
a blade positioned adjacent the exit end of said discharge passage and adapted to rotate across said exit end for cutting said lining material into said predetermined quantity; and
drive means for rotating said blade at a non-uniform speed in response to the speed of conveyance of said cap shells such that the speed of said blade gradually decreases as the exterior end of said blade in its radial direction approaches said shell-conveying passage, and such that the speed of said blade gradually increases as said exterior blade end moves away from said shell-conveying passage.

4,060,054

SYSTEM FOR HOG PRODUCTION IN A CONTROLLED ENVIRONMENT

Bruce A. Blair, 2400 Lakeview, Apt. 410, Chicago, Ill. 60614

Filed June 19, 1975, Ser. No. 588,330
Int. Cl.[2] A01K *1/00*
U.S. Cl. 119—16 34 Claims

1. Means for hog production in a controlled environment and including a housing rising from and covering a base providing a first floor of substantial expanse, and a multi-tiered structure spaced substantially inwardly from the perimeter of the housing, and comprising:
a plurality of vertically spaced tier floors above said first floor and all of the tier floors being equipped with hog finishing pens large enough to accommodate a social group of growing hogs to finished market size, each finishing pen having a social floor area in one end portion in

which the hogs penned therein for finish growing can congregate and rest, and each finishing pen having a slatted feeding and drop-through dunging floor area in an opposite end portion where hog feeding and dunging can take place without disturbing the hogs in the social area, there being automatic hog food supplying means in each feeding and dunging area;

the social areas of the finishing pens of each tier floor being vertically aligned with the same areas in the pens therebelow and the feeding and dunging areas of the finishing pens of each tier floor being vertically aligned with the same areas in the pens therebelow;

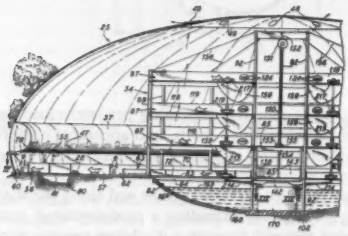
means under each of the slatted feeding and dunging areas for collecting dropped hog waste and funneling the waste to drop through such a small portion of the slatted feeding and dunging area therebelow that the hogs can readily avoid said small drop portion while using the feeding and dunging area;

a substantial width area on the first floor between said housing perimeter and said multi-tiered structure being divided into:

an annular array of farrowing pens for farrowing crates adjacent to the housing perimeter;

an annular array of breeding pens surrounded by said farrowing pens and having gates adjacent to the farrowing pens;

an annular array of nursery pens surrounded by and separated from the breeding pens by an annular aisle and adapted for receiving small nursery size pigs from the farrowing pens;



means enabling hand feeding of the nursery pigs from said aisle;

an annular array of training pens surrounded by and having gates separating them from the nursery pens and in which training pens trainer pigs are received from the nursery pens after attaining a stage of development in which they can adjust to automatic feeding means;

at least said training pens being under said tier floors in vertical alignment under said finishing pens and each training pen having a social area and a slatted feeding and drop-through dunging area both of which training pen areas are located in vertical alignment under the corresponding areas of the overhead finishing pens, and there being similar automatic hog food supplying means in the training pen feeding and dunging areas as in the overhead feeding and dunging areas of the finishing pens, the waste collecting means of the finishing pens funneling and dropping the hog waste through the training pen feeding and dunging areas in the same manner as in the like areas of the finishing pens, whereby to accustom the trainer pigs to the conditions in the upper tier floor finishing pens before transfer of the pigs as growing hogs to said finishing pens;

and means centrally located relative to the array of training pens by which the pigs are transferred to the hog finishing pens on said tier floors after a limited growth and training development time interval in said training pens.

24. A system for hog production in a controlled environment wherein facilities for large volume hog production are contained within a housing including animal pens from which animal waste drops downwardly, comprising:

a receiving basin under said pens and of ample capacity to accommodate all waste produced by a large number of animals for conversion into reusable animal feed for recycling into food supply for the animals;

a tank within said basin substantially immersed in the deepest part of the waste and having means for separating hog bristles from the waste material in the basin;

means for agitating and warming the waste material in the basin outside the tank to promote conversion;

means for supplying fresh feed to said tank;

means within the tank for combining the fresh feed and converted waste material derived from the basin into a feed mixture and for cooking and pasturizing the mixture;

means within the tank for cooling the cooked mixture; and

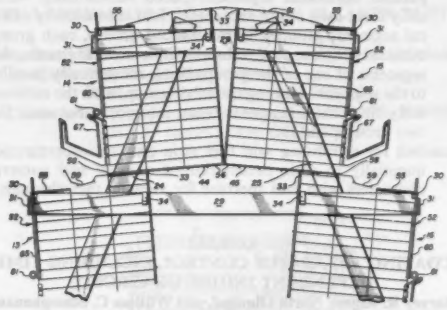
means for delivering the cooled feed mixture from the cooking and pasturizing means in the tank to said pens.

4,060,055

POULTRY CAGE STRUCTURE

Mark Skinner, Decatur, Ala., assignor to Chore-Time Equipment, Inc., Milford, Ind.

Continuation of Ser. No. 686,291, May 14, 1976, abandoned.
This application Mar. 25, 1977, Ser. No. 781,185
Int. Cl.[2] A01K *31/06*
U.S. Cl. 119—48 **7 Claims**



1. A cage structure for poultry and the like, comprising in combination, a plurality of cage rows mounted in steppedback, elevational array, each cage row including a plurality of cage end partitions, a separate, unitary L-shaped bottom/back member secured to the partitions and a separate, unitary L-shaped top/front member separated from the bottom/back member at the cage row top and front but secured to the end partitions to form a row of cages of rectangular cross-section, the L-shaped bottom/back member having a bottom element being extended forwardly from the cage row to define an egg collecting trough at the cage row front bottom, the L-shaped top/front member having a top element defining the forward portion only of the cage row top, the remaining portion of the cage row top being covered to prevent animal escape by the overhanging bottom/back member egg collecting trough of the cage row immediately above and to the rear, the L-shaped top/front member also having a front element defining the upper portion only of the cage row front, the cage structure further including feed trough means mounted to the cage row at the cage row lower front and defining the remaining portions of the cage row front.

4,060,056

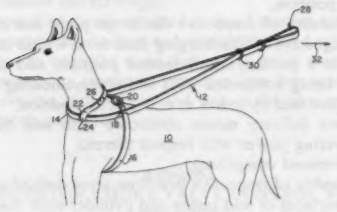
ANIMAL HARNESS

Josephine Maietta, 85-40 111 st St., Richmond Hill, N.Y. 11418

Filed Aug. 24, 1976, Ser. No. 717,245
Int. Cl.[2] A01K *27/00*
U.S. Cl. 119—96 **5 Claims**

1. An animal harness comprising a unitary construction, said unitary construction including an elongated endless band,

means to conform the proximal end of said endless band into a closed loop, an inverted substantially U-shaped band, one end of said U-shaped band slideably affixed to and adjacent with the distal end of said endless band, the other end of said U-shaped band slideably affixed to and adjacent with said distal end of said endless band and disposed in spaced apart relationship with said one end thereof, a waist cinching band, said waist cinching band slideably affixed to two portions of said



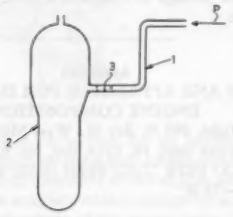
endless band intermediate said distal end and said proximal end thereof, said waist cinching band having a pair of free end portions thereof, means to adjustably secure one of said free end portions to and along the length of said waist cinching band at a point therealong located adjacent the other free end portion thereof, said endless band serving as the only means of interconnecting said U-shaped band and said waist cinching band together.

4,060,057

WATER SUPPLY PIPE FOR A STEAM GENERATOR

Marc Félix Maurice Carteus; Yvrs Marie Grovgrs De Bruyne, both of Brussels; Jean Pierre Gustaaf Rosa Lemmens, Heverlee, and Elie Jozef Stubbe, Sterrebeek, all of Belgium, assignors to Societe de Traction et D'Electricite S.A., Brussels, Belgium

Filed May 12, 1976, Ser. No. 685,605
Claims priority, application Belgium, May 12, 1975, 156239
Int. Cl.² F22D *5/00*
U.S. Cl. 122—451 R **3 Claims**



1. In combination, a steam generator, a water supply pipe coupled to said steam generator for supplying water thereto, the improvement wherein said water supply pipe comprises the following elements:

a horizontal or substantially horizontal pipe portion,

a lower baffle plate disposed in the pipe portion,

an upper opening defined by the lower baffle plate,

a horizontal lower edge defining the upper opening,

an upper baffle plate disposed in the pipe portion upstream of the lower baffle plate with respect to the normal flow direction of the water,

a lower opening defined by the upper baffle plate,

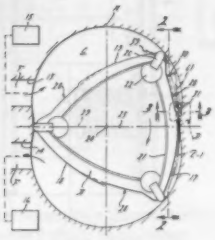
a horizontal upper edge which defines the lower opening and which is situated lower than the horizontal lower edge such that the two baffle plates together form a hydraulic barrier which, when the water supply is cut off or reduced, prevents or substantially limits the passage of the steam produced by the generator, this steam then condensing upstream of the upper baffle plate in contact with the water and restoring the hydraulic barrier.

4,060,058

INTERNAL COMBUSTION ENGINE CONTROL SYSTEM

Laszlo Hideg, Dearborn, and Robert P. Ernest, Dearborn Heights, both of Mich., assignors to Ford Motor Company, Dearborn, Mich.

Filed Nov. 28, 1975, Ser. No. 636,184
Int. Cl.² F02B *53/12*
U.S. Cl. 123—8.09 **10 Claims**



1. In an Otto cycle internal combustion engine of the rotary type having a housing with interior side walls and an end wall and providing a source of fuel, the apparatus comprising:

a. a volume defined by parallel flat surfaces of said side walls and closed by a continuous epitrochoid surface of said end wall,

b. a multi-lobed rotor received in said volume with apices of each lobe arranged to sealingly engage said epitrochoid and flat surfaces thereby defining one or more variable volume combustion chambers, each combustion chamber receiving fuel from said source to provide a combustible mixture when in the smallest volume condition, and

c. means exterior to each of said combustion chambers for igniting a combustible mixture in a confined space smaller than any of said combustion chambers when in the smallest volume condition, said exterior means being effective to selectively generate a torch flame during each expansion cycle of said engine and to direct said torch flame into the trailing portion of at least one of said combustion chambers opposite to the flow of gases therein and particularly when substantially in the smallest volume condition and without contact with walls defining said one combustion chamber.

4,060,059

INTERNAL COMBUSTION ENGINE

Florencio Blaser, Alexandria, Va., assignor to Blaser Engine, Ltd., College Park, Md.

Continuation of Ser. No. 422,719, Dec. 7, 1973, which is a continuation of Ser. No. 123,705, March 12, 1971, abandoned. This application May 27, 1977, Ser. No. 801,401
Int. Cl.² F02B *9/00, 75/10, 33/00*; F02F *3/14*
U.S. Cl. 123—32 ST **7 Claims**

1. A method of operating an internal combustion engine having a cylinder closed at one end, a piston movable within said cylinder between a first position proximate to said one end and a second position remote from said one end to form a working chamber, said piston having a piston chamber, comprising the steps of:

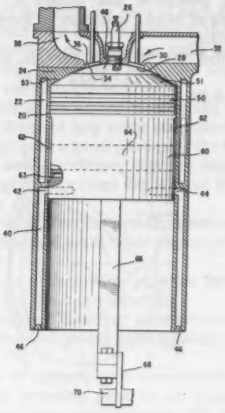
introducing a rich air-fuel mixture into said working chamber from said one end during an intake stroke of said piston;

adding additional air to said working chamber during said intake stroke adjacent said piston as said piston approaches said second position;

transferring said additional air from said working chamber to said piston chamber during a compression stroke of said piston;

igniting said rich air-fuel mixture to produce a quasi-instantaneous first phase of combustion; and

transferring said additional air from said piston chamber to



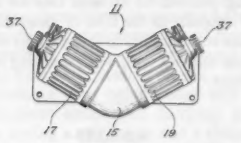
said working chamber at an intermediate point of a power stroke of said piston in response to decreasing pressure within said working chamber as said working chamber expands following said first phase of combustion to participate in a second phase of combustion over a period of time of the unburned fuel remaining after said first phase of combustion.

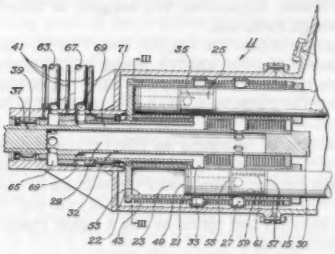
4,060,060

VALVING SYSTEM FOR COMPRESSORS, ENGINES AND THE LIKE

William F. Turner, Graham, Tex., assignor to Turner Research, Inc., Graham, Tex.

Filed May 17, 1976, Ser. No. 687,207
Int. Cl.[2] F02B *57/06*
U.S. Cl. 123—43 A **14 Claims**





1. In a rotary vee device that includes:

a. a rotational cylinder block having a plurality of cylinders defined therewithin and rotatable about a central longitudinal axis;

b. a plurality of pistons disposed within said cylinders such that there is relative rotational and reciprocal motion between interior walls of said cylinder and the exterior walls of said pistons;

c. a plurality of respective inlet ports and passageways for intake of a fluid within respective cylinders atop respective said pistons therewithin at least by the time said pistons and said cylinders have attained a predetermined first position; said intake ports being connected with and communicating with respective said cylinders at least by said first position;

d. a plurality of respective discharge ports and discharge passageways for discharging fluid from within said cylinder at a predetermined second position; said discharge port being connected with and communicating with respective said cylinders at said second position;

e. power delivery means connected with said device for delivering power with respect thereto;

an improvement comprising:

f. a plurality of respective first flow areas defined on one of the surfaces of said piston and cylinder such that respective ports will traverse thereacross during a revolution of said cylinder block;

g. a plurality of first flow passageways communicating intermediate said first flow area and its said cylinder, at least one for each said cylinder and piston; each said first fluid passageway terminating at a first end in communication with the interior of its respective said cylinder above its respective said piston and at its second end in communication with its respective said first flow area;

h. said respective plurality of intake ports and discharge ports comprising apertures located at predetermined locations on the other of said surface of said cylinder and piston and connected with respective intake and discharge passageways for respective intake and discharge flow of a fluid when a respective port is rotatably and reciprocally brought into communication with its said first flow area;

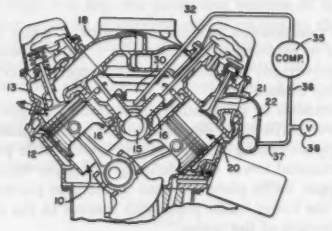
such that as respective said relative rotational and reciprocal motion is effected between respective said pistons and cylinders an intake flow passage is defined for intake of a fluid interiorly of said cylinder, followed by closure of said intake flow passage, followed by pressurizing of said fluid, followed by opening of a discharge flow passage for discharge of a fluid from the interior of said cylinder, followed by closure of said discharge flow passage to complete a cycle; thereafter repeating said cycle.

4,060,061

PROCESS AND APPARATUS FOR IMPROVED I.C. ENGINE COMPOSITION

Willard C. Might, 393 N. Jay St., West Milton, Ohio 45383

Filed Sept. 19, 1975, Ser. No. 615,179
Int. Cl.[2] F02B *75/02;* F02D *39/02;* F02M *7/12*
U.S. Cl. 123—75 B **6 Claims**



1. An Otto cycle internal combustion engine having at least one cylinder and a piston having a head and reciprocable therein through intake, compression, expansion and exhaust strokes, intake and exhaust valves controlling the admission of a charge to said cylinder and the exhaust of products of com-

bustion, and valve operating mechanism having timed relation to piston movement; the improvement comprising

means forming an inlet into said cylinder separate from the inlet valve and below the top dead center position of the head of said piston,

means connected to supply gas under pressure to said inlet means,

an inlet control valve connected between said compressor means and said inlet means to control the timing of gas admission therethrough,

and operating means actuated in timed relation to said valve operating mechanism and controlling said inlet control valve to open the same during the initial portion of the compression stroke to introduce gas into said cylinder above the piston head and below the charge admitted through said intake valve.

4,060,062

CARBURETOR CHOKE VALVE CONTROL SYSTEM APPARATUS

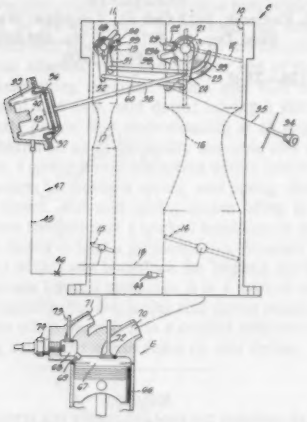
Katsuhiko Tsutsui; Heihachi Miura, and Yukio Miyano, all of Kawasaki, Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Nov. 3, 1975, Ser. No. 628,087

Claims priority, application Japan, Nov. 6, 1974, 49-127716

Int. Cl.[2] F02B *75/02*; F02D *39/02*

U.S. Cl. 123—75 B **6 Claims**



1. For use with a carburetor for an internal combustion engine, the carburetor having a main intake passage for supplying main combustion chambers of the engine with a lean mixture and having an auxiliary intake passage for supplying auxiliary combustion chambers of the engine with a rich mixture, the improvement comprising, in combination: a main choke valve in the main intake passage and fixed on a shaft, a first lever fixed to the shaft, a second lever mounted to turn on the shaft, a spring acting to turn the second lever with respect to the first lever, hook means on the first lever limiting such turning movement of the second lever, an auxiliary choke valve in the auxiliary intake passage, means including an auxiliary lever for moving the auxiliary choke valve, means including a lost-motion connection between said second lever and said auxiliary lever whereby the auxiliary choke valve is moved from open position toward closed position only after predetermined closing movement of said main choke valve, a third lever mounted to turn on the shaft and engageable with said hook means, connecting means whereby said third lever may move said auxiliary choke valve, and means responsive to reduction in pressure in one of said intake passages upon starting of the engine to cause the third lever to open both choke valves.

4,060,063

THROTTLE POSITIONER

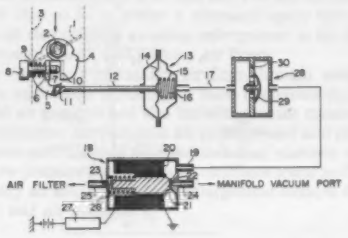
Koichi Hirasawa, Toyota, Japan, assignor to Toyota Jidosha Kogyo Kabushiki Kaisha, Toyota, Japan

Filed Aug. 13, 1975, Ser. No. 604,209

Claims priority, application Japan, June 2, 1975, 50-74612[U]; June 2, 1975, 50-74613[U]

Int. Cl.[2] F02D *31/00*

U.S. Cl. 123—97 B **9 Claims**



1. A throttle positioner for a throttle valve of an automobile engine having a rotary shaft, comprising:

a lever fixedly mounted on said rotary shaft;

a lever driving element mounted on said rotary shaft to be freely rotatable with respect to said shaft and adapted to drive said lever in a direction to open said throttle valve;

said lever and said lever driving element individually having lugs confronting each other;

said lug and said lever driving element supporting an adjusting screw threadably mounted thereto;

said adjusting screw having a tip end which drivingly abuts against said lug of said lever, whereby movement of said screw supported by said lever driving element in a first direction imparts motion of said lever;

a diaphragm means drivingly connected to said lever driving element so as to drive said lever in a first direction to ensure that said throttle valve is opened at least to a throttle positioner preset opening when a vacuum is applied thereto;

said lever driving element being adapted to release said lever in a second direction opposite to said first direction when atmospheric pressure is applied thereto;

passage means for supplying the manifold vacuum or atmospheric pressure to said diaphragm means;

an electro-magnetic valve which controls said passage means to selectively supply the manifold vacuum or atmospheric pressure through said passage means, and

an electric circuit means for controlling said electro-magnetic valve in accordance with the operational conditions of the vehicle which incorporates the throttle positioner.

4,060,064

VARIABLE SIZE VENTURI CARBURETOR WITH AN ELECTRONIC AIR/FUEL RATIO CONTROL SYSTEM

Hidehiro Minami, Yokohama, and Hideo Kamino, Chofu, both of Japan, assignors to Nissan Motor Company, Limited, Yokohama, Japan

Filed Mar. 18, 1976, Ser. No. 668,072

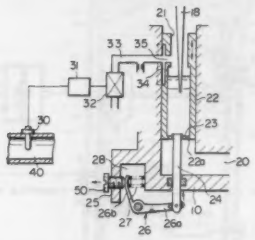
Claims priority, application Japan, Mar. 20, 1975, 50-38593

Int. Cl.[2] F02M *7/00*

U.S. Cl. 123—119 EC **5 Claims**

1. In a variable size venturi carburetor of an internal combustion engine with an electronic air/fuel ratio control system operable in accordance with at least one engine operating variable and having a body defining a bore, a suction responsive piston projecting into the bore to form a venturi and movable in response to the suction adjacent the venturi to be withdrawn from the bore, a fuel delivery passageway in the body through which fuel is discharged from a reservoir to the

venturi, a metering needle valve extending from the suction responsive piston across the venturi into the fuel delivery passageway, and additional air delivery passageway being controlled by the electronic air/fuel ratio control system, the improvement comprising; a tubular nozzle carrying member vertically slidably fitted in the fuel delivery passageway and in constant communication with said additional air delivery passageway and means for manually vertically displacing said nozzle carrying member relative to the body to adjust the



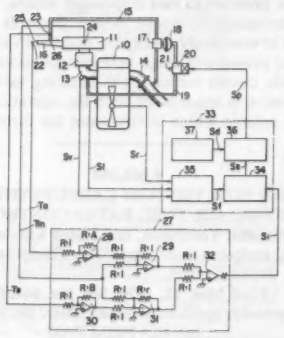
position of the nozzle with respect to the venturi, a manual adjusting screw having indicating means mounted in the carburetor body and linkage means to transfer the adjustment of the adjusting screw to the nozzle carrying member to move the same relative to the body, said linkage means having an L-shaped pivotal lever having one arm abutting against one end of the adjusting screw opposite to the screw head and the other arm operatively linked with the bottom of the tubular nozzle carrying member.

4,060,065

EXHAUST GAS RECIRCULATION SYSTEM HAVING MEANS TO ESTIMATE ACTUAL RECIRCULATION RATE BASED ON INTAKE AND EXHAUST GAS TEMPERATURES

Yoshitaka Hata, Fujisawa; Kenji Ikeura, Yokohama, and Masaaki Ozeki, Chigasaki, all of Japan, assignors to Nissan Motor Company, Limited, Yokohama, Japan

Continuation of Ser. No. 515,061, Oct. 15, 1974, abandoned. This application May 25, 1976, Ser. No. 689,864
Claims priority, application Japan, Oct. 23, 1973, 48-119239
Int. Cl.² F02M *25/06*
U.S. Cl. 123—119 A **3 Claims**



1. A method of estimating the exhaust gas recirculation rate in an internal combustion engine having a recirculation passage for recirculating a portion of the exhaust gas from the exhaust line to the induction passage of the engine, so that the recirculated exhaust gas is mixed with a fresh gas which is either air or an air-fuel mixture flowing through the induction passage at a section where the recirculation passage joins the induction passage, the recirculation rate being defined by the ratio of the mass of the recirculated exhaust gas per unit time to the mass flow rate of said fresh gas in the induction passage, the method comprising the steps of:

measuring the respective temperatures of said fresh gas, the recirculated exhaust gas and a resulting mixture of said fresh gas and the recirculated exhaust gas; and computing the recirculation rate by the following equation,

$$\frac{q}{Q} = \frac{T_m - \frac{C_a}{C_m} \cdot T_a}{\frac{C_e}{C_m} \cdot T_e - T_m}$$

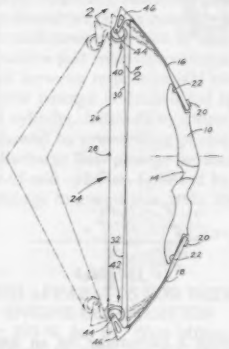
where q is the mass of the recirculated exhaust gas per unit time, Q is the mass flow rate of said fresh gas at said section of the induction passage, T is gas temperature, C is specific heat, and the subscripts a, e and m represent said fresh gas, recirculated exhaust gas and a resulting mixture, respectively.

4,060,066

COMPOUND ARCHERY BOW WITH ECCENTRIC CAM ELEMENTS

Donald S. Kudlacek, 3412 Oak St., Longview, Wash. 98632

Filed Dec. 11, 1975, Ser. No. 639,649
Int. Cl.² F41B *5/00*
U.S. Cl. 124—23 R **2 Claims**



1. A compound archery bow comprising:

a. a handle member,

b. a pair of bow limbs projecting from opposite ends of the handle member,

c. a pair of cam members each comprising a pair of cam elements of different diameters secured together eccentrically and having a common pivot axis which is eccentric with respect to both cam elements,

d. a pivot member on the outer end of each limb pivotally mounting one of the cam members on said pivot axis which is eccentric with respect to both cam elements, and

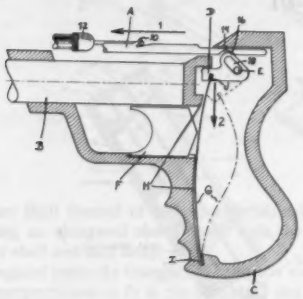
e. a bow string having a medial working stretch segment for projecting an arrow and opposite end segments each extending therefrom and wrapped first over the peripheral surface of the larger diameter cam element of the associated cam member, thence over the peripheral surface of the smaller diameter cam element and being secured to the cam member, and thence extending from the smaller diameter cam element of the associated cam member to attachment with the opposed limb.

4,060,067

TRIGGER ASSEMBLY FOR SPRING LOADED WEAPONS

Pierre Dandine, 23 Boulevard Franck Pilatte 06300, Nice, France

Filed Nov. 20, 1975, Ser. No. 633,785
Claims priority, application Monaco, Nov. 21, 1974, 1130
Int. Cl.[2] F41B 7/04
U.S. Cl. 124—31 10 Claims



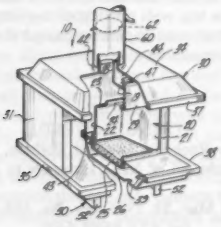
1. A trigger assembly for launching the projectile of a spring loaded weapon comprising a barrel hollow butt stock in which the rear end of the projectile is received, an axle fixedly mounted in said butt stock transversely to the direction of the barrel, a detent adapted to engage the rear end of the projectile, said detent being mounted within said butt stock and swingable about said axle, said detent having a slot through which said axle passes, said slot extending at an angle to the axis of said barrel so as to be axially movable and pivotable about the axle, a spring means supported within said butt stock, said spring means including a spring, said spring directly engaging said detent, and said spring means being in stressed condition when the gun is in a cocked condition to produce a force on said detent to hold a projectile in a retracted position, means located within said butt stock for limiting the flexing of said spring means when a projectile is in a cocked condition, and a trigger member for displacing said spring means from its flexed position when the gun is in a cocked position to a position releasing the spring means force on said detent.

4,060,068

AIR COOLED FREESTANDING FIREPLACE

Paul H. Lever, Fallbrook, and Clifford D. Mohr, Rancho, both of Calif., assignors to Fireplace Corporation of America, Walled Lake, Mich.

Filed Nov. 28, 1975, Ser. No. 636,187
Int. Cl.[2] F24B 1/18
U.S. Cl. 126—120 8 Claims



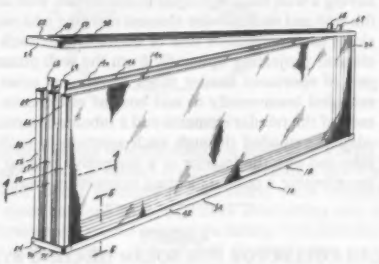
1. A fireplace unit comprising: an outer housing having a rear wall, a top, bottom and side walls and a frontal opening;
a flue connected to an opening in said outer housing;
a firebox disposed within said outerhousing, an opening corresponding to said outer housing frontal opening and having a floor for supporting a hearth;
said firebox also including bottom, sides and rear wall at least some of said walls or floor being supported in spaced apart relationship to said outer housing bottom, sides, or top to define air passages therebetween;
means for creating primary air flow through said firebox for supporting combustion therein, said means including a pipe connecting said firebox with said flue, said pipe being of smaller cross-sectional area than said flue and extending into said flue so as to define a clearance space therebetween and also defining a sudden enlargement in the flow path through which said primary air flows;
means for creating a secondary air flow through said air passages, said means including air inlets in communication with said air passages and also including means creating a fluid connection between said air passages and said clearance space between said pipe and said flue, whereby relatively low pressure created in said clearance space by flow of primary air into said sudden enlargement induces flow through said air passages.

4,060,069

WINDOW UNIT FOR USE IN OVEN DOORS

Claude Drouin, Ste-Julie, Canada, assignor to Les Industries BFG Limitee, Montmagny, Canada

Filed Apr. 14, 1976, Ser. No. 676,874
Claims priority, application Canada, Apr. 12, 1976, 250042
Int. Cl.[2] F23M 7/00
U.S. Cl. 126—200 3 Claims



1. A window unit for use in an oven door comprising, in combination:
a frame consisting of top and bottom members and a pair of side members; and
glass sheets supported in said frame and arranged in spaced parallel relationship to define air spaces between adjacent glass sheets;
said top and bottom frame members each having laterally spaced longitudinal portions forming channels to individually receive therein a major portion of the upper and lower marginal edges of said glass sheets, said top and bottom frame members each further including full end portions receiving the remaining extremity portions of said marginal edges;
said pair of side frame members each having recessed portions forming side channels to receive therein side marginal edges of said glass sheets; each said side frame member including, at opposite ends thereof and between said side channels, outwardly projecting tongues extending between said channels of said top and lower frame members; said tongues being made of a material capable of being bent whereby said tongues may be folded over corresponding end portions of said top and bottom frame members to thereby lock said frame members in assembly with said glass sheets contained therein; air circulation through said unit being effected between said channels of said bottom frame member, up said air spaces between said

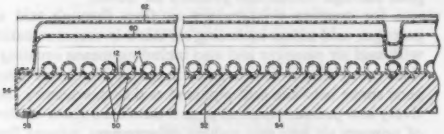
glass sheets, and between said channels of said top frame member.

4,060,070

SOLAR HEATING

Donald Gerton Harter, Holmdel, N.J., assignor to Solar Industries, Inc., Farmingdale, N.J.

Filed Jan. 22, 1976, Ser. No. 651,479
Int. Cl.² F24J 3/02
U.S. Cl. 126—271 **1 Claim**



1. A mechanism for the collection of heat from solar radiation by the maximizing of the surface area capable of absorbing direct radiation and diffuse radiation and trapping some radiation for purposes of reradiation comprising:

a unitary construction of a polymer mixed with a black coloring agent consisting of planar web of a certain thickness and certain width and certain length and a multiplicity of closed-spaced parallel-disposed tubular elements extending across the entirety of the certain web width and throughout the entirety of the certain web length,

each tubular element being of circular cross section and having a wall thickness equal to the certain web thickness, the web and each tubular element merging into each other along each respective line of contact with each tubular element projecting upwardly from the web plane,

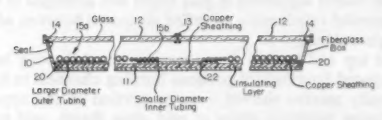
a pair of apertured header tubes of circular cross section extended transversely to and bonded at opposite ends of each of the tubular elements and a tubular communicating adapter extended through each aperture in each header tube and into the interior of a respective tubular element for effecting a communicating connection therebetween.

4,060,071

SOLAR COLLECTOR FOR SOLAR HEATING SYSTEMS

Emil L. Chayet, Largo, Fla., assignor to Solar Energy Dynamics Corporation, Tampa, Fla.

Filed June 17, 1976, Ser. No. 696,988
Int. Cl.² F24J 3/02
U.S. Cl. 126—271 **10 Claims**



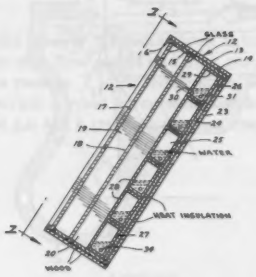
1. A solar collector for use in a solar heating system, comprising a sealed housing, one face of said housing being planar and being transparent to admit solar radiation to the interior of said housing, a continuous length of tubing tightly coiled in a substantially flat planar helical array of closely adjacent contiguous turns, means for supporting said flat planar helical tubing array within said housing with the plane of said array being disposed substantially parallel to the plane of said transparent housing face, said array comprising two pluralities of helical turns respectively connected in series flow communication with one another and respectively disposed in concentric, substantially coplanar relation to one another, the diameters of the tubings in said two pluralities of helical turns respectively differing from one another, a flow inlet line connected to the larger diameter tubing one of said two pluralities of helical turns and a flow outlet line connected to the smaller diameter tubing one of said two pluralities of helical turns.

4,060,072

SOLAR HEATER APPARATUS

Donald F. Johnson, Watertown, S. Dak., assignor to American Solar Energy Corporation, Denver, Colo.

Filed July 1, 1976, Ser. No. 701,759
Int. Cl.² F24J 3/02
U.S. Cl. 126—271 **7 Claims**



1. Solar heating apparatus comprising a solar panel having a perimetric frame that has an upper wall, a lower wall, an open front side, and an open back side, first means joined to the frame to close the back side opening, second means that permits passage of infrared rays of the sun mounted on the frame in substantial spaced relationship to the first means to close the front side opening, wall means defining a plurality of horizontally elongated tubular fluid channels with one extending vertically above the other mounted in the frame between the first and second means and spaced from the second means, each channel having a top wall portion, a bottom wall portion, a first end wall and a second end wall, a liquid inlet opening to the interior of the vertically uppermost fluid channel adjacent the first end wall thereof, a liquid outlet opening to the interior of the vertically lowermost fluid channel adjacent one of the end walls thereof, and conduit means opening to interiors of the fluid channels adjacent the end walls thereof other than the ones adjacent the liquid inlet and liquid outlet for interconnecting the channels to provide a liquid flow path between the channels from the liquid inlet to the liquid outlet with the liquid flowing in a direction through a channel that is opposite the direction of flow through the channel immediately vertically therebeneath, means remote from the panel for storing heat energy, and means for conducting liquid from the liquid outlet to the heat storing means and from the heat storing means to the liquid inlet whereby liquid from the heat storing means passes through the liquid inlet and along the liquid flow path to the liquid outlet, the liquid connecting means including means for controlling the flow of liquid through the liquid inlet to maintain liquid in each channel at a level that is a substantial distance below the top wall portion of the respective channel to provide a dead air space in each channel above the level of the liquid in the respective channel.

4,060,073

SYRINGE SHIELD

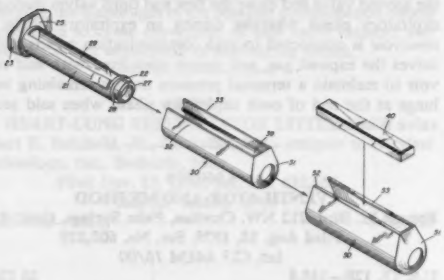
Carl Collica, New Rochelle; Leonard Epifano, Rye, and Ralph Farella, Scarsdale, all of N.Y., assignors to Medi-Ray, Inc., Tuckahoe, N.Y.

Filed Mar. 19, 1976, Ser. No. 668,532
Int. Cl.² A61B 6/00
U.S. Cl. 128—1.1 **15 Claims**

1. A syringe shield, comprising:

an inner generally cylindrical shell formed of poastic material having an elongated slot extending longitudinally therein;

a generally cylindrical lead body, said body being proportioned such that its inner surface conforms generally to the outer surface of said inner shell, said body having an elongated slot aligned with the slot in said inner shell;



an outer shell formed of plastic material, said outer shell having an elongated slot aligned with the slots in said inner shell and said body; and

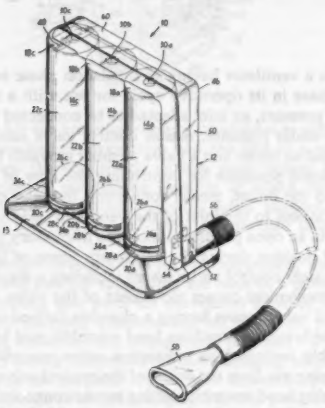
an elongated optically transparent radiation shielding member proportioned to fit in the elongated slot in said body.

4,060,074

INHALATION DEVICE

Ronald D. Russo, Hamden, Conn., assignor to Chesebrough-Pond's, Inc., Greenwich, Conn.

Filed Feb. 11, 1976, Ser. No. 657,242
Int. Cl.² A61M *16/00*
U.S. Cl. 128—2.08 **15 Claims**



1. A self-supporting incentive inhalation device for inducing respiratory exercise, comprising:

a container having a plurality of transparent compartments in alignment along an axis of said container,

said compartments each having a top wall, a bottom wall, a vertical wall therebetween, and a chamber therewithin which extends from said bottom wall to said top wall,

a light-weight article in each of said chambers which is normally in the lower portions thereof,

a slot in each of said compartments which extends through the lower portion thereof and connects each of said chambers to the surrounding atmosphere at a point at least partially below each of said articles,

a passageway in said container which extends over said compartment top walls and has an outlet adjacent one of the outer of said chambers,

a restricted port in each compartment which extends through said top wall thereof and connects said chambers to said passageway,

a ridge in said last compartment depending from the top wall thereof to prevent said article therein from closing said last top port,

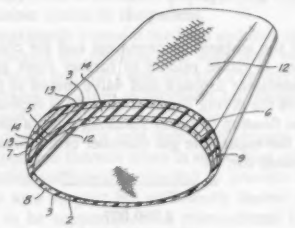
means connected to said outlet to allow a person to withdraw air from said chambers through said passageway, whereupon said article is said chamber adjacent said outlet rises to the top thereof and closes said top port when a person inspires air at a precalibrated flow rate, said article in each intermediate chamber sequentially rises to the top thereof and closes each intermediate top port when a person inspires predetermined additional amounts of air at a precalibrated flow rate, and said article in the last of said chamber rises to the top thereof and contacts said depending ridge therein when a person inspires still an additional predetermined amount of air at a precalibrated flow rate.

4,060,075

SPLINT AND BODY-SUPPORT DEVICE

Alois Blomer, Gildenstrasse 61, 4390 Gladbeck, and Hans Schulze, Fliederweg 8, 5931 Netphen-Deuz, both of Germany

Filed Jan. 6, 1976, Ser. No. 646,978
Int. Cl.² A61F *5/04*
U.S. Cl. 128—90 **15 Claims**



1. A device for the immobilization or support of a body part of a human or animal subject comprising a flexible envelope of double-wall tubing having a pair of fabric walls defining an annular space between them, partitions subdividing said space into compartments spaced around the tubing, two interreactive reaction compounds in each of said compartments, and destructible means holding said reaction compounds apart but adapted to be destroyed by an applied effect to permit mixing of said reaction compounds and setting of the resulting reaction mixture to retain a contour applied to said envelope.

4,060,076

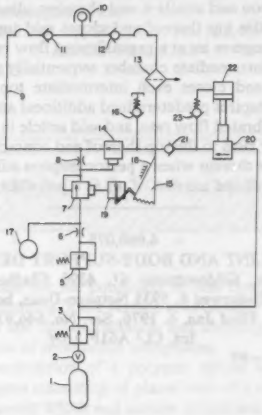
BREATHING APPARATUS INCORPORATING DEPTH COMPENSATION

Imre Botos, Lidingo, and Ivan Aldine Hellquist, Rotebro, both of Sweden, assignors to AGA Aktiebolag, Lidingo, Sweden

Filed Feb. 26, 1976, Ser. No. 661,491
Claims priority, application Sweden, Mar. 14, 1975, 7502856
Int. Cl.² A62B *7/00*
U.S. Cl. 128—142 R **4 Claims**

1. Breathing apparatus for use under water comprising: a fresh gas container, connection means for connecting the apparatus to the breathing organ of a user, a breathing circuit in communication with said connection means and comprising carbon-dioxide absorbing means in communication with said connecting means, an expansible gas chamber in communication with said connection means and control means for controlling the operation of said breathing circuit to provide (i) a first operating period wherein said breathing circuit is closed and a breathing gas is caused to circulate in said breathing circuit until the oxygen concentration of the circulating breathing gas is reduced to a predetermined value and (ii) a second operating period, which alternates with said first period, wherein the

used breathing gas is released to the ambient environment and a fresh gas, the quantity of which is substantially independent of the depth of the user under the water surface, is supplied to the breathing circuit; wherein the improvement comprises a valve means disposed in a connection between said fresh-gas container and said breathing circuit, and means for sensing the



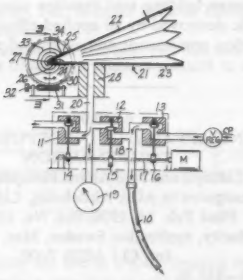
pressure of the ambient environment and for controlling said valve means to cause release of further fresh gas from said fresh gas container through said valve means to the breathing circuit when the diving depth of the user is increased whereby a change in floating capacity resulting from a decrease in the volume of the expansible gas chamber of the breathing circuit is compensated for.

4,060,077

RESPIRATOR

Irving Friedman, New Haven, Conn., assignor to Diana W. Friedman, New Haven, Conn.

Filed Nov. 12, 1975, Ser. No. 631,374
Int. Cl.² A61M *16/00*
U.S. Cl. 128—145.8 **9 Claims**



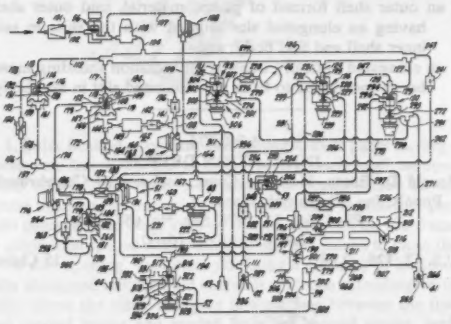
1. A respirator comprising, means for establishing communication with a patient's lungs, means for continuously supplying gas at a predetermined pressure, an expansible and contractible reservoir, a first conduit containing a first valve connected between said supplying means and said communication means, a second conduit containing a second valve connected between said communication means and said reservoir said second conduit including an unobstructed passageway between said reservoir and said second valve, a third conduit containing a third valve downstream from said reservoir and also connected to said second conduit between said reservoir and said second valve, said third conduit communicating with the atmosphere when said third valve is open, means associated with said reservoir for monitoring and indicating the volume of gas received therein, and valve actuating means adapted simultaneously to open the first and third valves and close the second valve during the inspiratory phase and to simultaneously open the second valve and close the first and third valves during the expiratory phase whereby during an expiratory phase said reservoir is connected to said communication means and receives the expired gas, and means associated with said reservoir to maintain a terminal pressure on gas remaining in the lungs at the end of each expiratory phase when said second valve is open.

4,060,078

VENTILATOR AND METHOD

Forrest M. Bird, 212 NW. Cerritos, Palm Springs, Calif. 92262

Filed Aug. 18, 1975, Ser. No. 605,529
Int. Cl.² A61M *16/00*
U.S. Cl. 128—145.8 **33 Claims**



1. In a ventilator having an inhalation phase and an exhalation phase in its operative cycle for use with a source of gas under pressure, an inlet adapted to be connected to the source of gas under pressure, master control valve means having an inlet and an outlet and a valve member movable between open and closed positions for controlling the flow of gas from the inlet to the outlet, means connecting the inlet of the control valve means to the inlet of the ventilator, said valve member being in an open position during the inspiratory phase and in a closed position during the expiratory phase of the ventilator, said master control valve means including a diaphragm which upon movement causes movement of the valve member, said control valve means having a chamber formed on one side of the diaphragm, a breathing head assembly, said breathing head assembly including an exhalation valve assembly, means for supplying gas from the outlet of the control valve means to the breathing head assembly, timing means connected between the outlet of the control valve means and said chamber for timing the introduction of gases into said chamber during the inspiratory phase and the bleeding of gases from said chamber during the expiratory phase to thereby control the movement of the valve member to initiate the inspiratory and expiratory phases of the ventilator, means for sensing the pressure of the gases in the breathing head assembly and baseline compensation means connected to the inlet of the ventilator and responsive to the sensed pressure in the breathing head assembly for supplying gas to the exhalation valve assembly so that the patient must exhale against a substantially constant positive pressure, said baseline compensation means including an inlet and an outlet with the inlet being connected to the inlet of the ventilator and the outlet being connected to the exhalation valve assembly, a valve member movable between open and closed positions for controlling the flow of gas from the inlet to the outlet of the baseline compensation means, said baseline compensation means including a diaphragm and means forming a chamber on

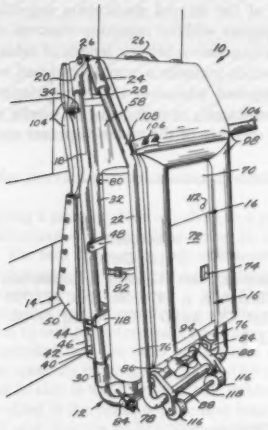
one side of the diaphragm whereby upon movement of the diaphragm the valve member is moved between said open and closed positions, means connecting the chamber of the baseline compensation means to means for sensing the pressure of the gases in the breathing circuit, yieldable spring means for yieldably urging the diaphragm of the baseline compensation means in a direction to cause movement of said valve member and means for causing adjustment of said spring means.

4,060,079

HEART-LUNG RESUSCITATOR LITTER UNIT

Herbert E. Reinhold, Jr., Rockville, Md., assignor to Survival Technology, Inc., Bethesda, Md.

Filed Nov. 17, 1975, Ser. No. 632,657
Int. Cl.[2] A61M *16/00*
U.S. Cl. 128—145.8 **8 Claims**



1. A device for use under emergency conditions in applying heart-lung resuscitation procedures and the like to a patient while supported thereon which enables such patient to be transported from an inaccessible location of attack onto an ambulance stretcher without removing such support, said device being in the form of a self-contained portable unit, said unit comprising:

a frame structure having a first part for supporting the legs and a second part for supporting the back of a patient,

means connecting said parts for movement between a collapsed unit carrying position and an extended patient supporting treatment and transporting position,

downwardly facing horizontal surface engaging means on said first and second parts of said frame structure operable when said frame structure is disposed in said patient treatment and transporting position to engage a horizontal surface such as a floor or the like and support said frame structure in stable relation thereon,

said parts including upwardly facing patient engaging means on said frame structure operable when said frame structure is disposed in said patient treatment and transporting position to engage and support a patient on said frame structure in a supine position and cooperating with said horizontal surface to provide for a relatively unyielding support of the patient's back area sufficient to effect cardiac compression through the application of periodic mechanical downward forces on the chest area of the patient,

means carried by said frame structure on said second part for applying said periodic mechanical downward forces on the chest area of the patient when said patient engaging means and said horizontal surface engaging means are in cooperating relation as aforesaid,

said upwardly facing patient engaging means on said second part being contoured adjacent the head end of said frame structure to support the head of the patient in a position extending downwardly from the adjacent back area so that the breathing channel is maintained in a favorable position for the reception of oxygen,

storage compartment means carried by said frame structure on said first part thereof in a position generally below the level of the associated patient engaging means when said frame structure is disposed in said patient supporting position so as to define a space for the reception of suitable emergency treatment supplies which is conveniently accessible,

oxygen tank supporting means carried by said frame structure on said first part for supporting a pair of oxygen cylinders in a position generally below the level of the associated patient engaging means alongside said storage compartment means,

the downwardly facing horizontal surface engaging means of said first and second parts and the leg supporting portions of the upwardly facing patient engaging means on said first part when in said patient supporting position being disposed in generally parallel planes spaced apart a distance generally equal to the vertical height of the space defined by said storage compartment means,

means carried by said frame structure engageable with a patient supported as aforesaid for supplying oxygen from said container means to the patient,

manually engageable means at the head and foot ends of said frame structure for enabling two attendants stationed at said ends to lift and carry said unit and a patient supported on said frame structure as aforesaid by manual engagement of said manually engageable means,

the width dimensions of said unit with oxygen container means supported thereon when in supporting relation to a patient being sufficiently extended to provide the aforesaid back area support but sufficiently limited to enable the unit to be supported on a conventional ambulance stretcher, and

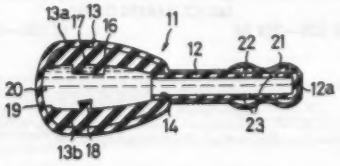
said horizontal surface engaging means of said first and second parts when said frame structure is in said collapsed position being disposed in adjacent relation so that with oxygen container means supported on the unit the latter is of a size and shape to enable movement thereof by one attendant to an inaccessible location of attack.

4,060,080

PLUG FOR LIVING BODY

Taichiro Akiyama, 2-19-23, Shimoochiai, Shinjuku-ku, Tokyo, Japan

Filed Mar. 15, 1976, Ser. No. 667,122
Claims priority, application Japan, Mar. 17, 1975, 50-35609[U]; Nov. 22, 1975, 50-158874[U]
Int. Cl.[2] A61F *11/02*
U.S. Cl. 128—152 **8 Claims**



1. A plug for insertion into a natural orifice of the body comprising

a. a first chamber and an actuating means located therein;

b. a tube member;

c. a second chamber communicating with said first chamber through said tube member, said second chamber being formed by said tube member and a flexible envelope at-

tached to the outer surface of said tube member, said first chamber being formed of a flexible envelope;

d. said actuating means comprising a pair of substantially flat actuating members;

e. said actuating means being formed of elastic material whereby facing wall surfaces thereof are normally held in spaced-apart relationship,

f. cooperating locking means disposed on the respective facing wall surfaces whereby forcing said actuating means together operates to unite the actuating members and to hold the actuating members in the united position;

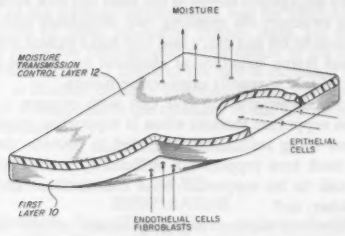
g. and a fluid located in said first and second chambers, said fluid being pressed into said second chamber through said tube member when the volume of said first chamber is reduced by forcing said actuating members together so that the volume of said second chamber is increased.

4,060,081

MULTILAYER MEMBRANE USEFUL AS SYNTHETIC SKIN

Ioannis V. Yannas, Newton Center; John F. Burke, Belmont; Philip L. Gordon, Lexington, all of Mass., and Chor Huang, Avon Lake, Ohio, assignors to Massachusetts Institute of Technology, Cambridge, Mass.

Filed July 15, 1975, Ser. No. 596,112
Int. Cl.² A61L *15/00*
U.S. Cl. 128—156 **24 Claims**



1. A multilayer membrane, comprising:

a. a first layer formed from a crosslinked collagen-mucopolysaccharide composite containing at least about 0.5% by weight mucopolysaccharide; and,

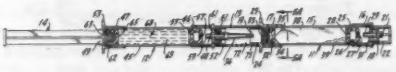
b. a moisture transmission control layer formed from a non-toxic material, said moisture transmission control layer providing said multilayer membrane with a moisture flux of from about 0.1 to about 1 mg/cm²/hr.

4,060,082

DUAL-INGREDIENT MEDICATION DISPENSER

Richard M. Lindberg, Des Plaines, and Srinivas T. Raghavachari, Chicago, both of Ill., assignors to MPL, Inc., Chicago, Ill.

Filed Aug. 16, 1976, Ser. No. 714,661
Int. Cl.² A61M *5/00*
U.S. Cl. 128—218 M **9 Claims**



1. A dual ingredient medication dispenser comprising:

a mixer-dispenser syringe including a housing having an outlet end and an outlet end, a dispensing valve-seal member normally sealing the outlet end of the housing, an inlet valve-seal member normally sealing the inlet end of the housing, the inlet valve-seal member being actuatable from a normal closed condition to an open condition by engagement with a fill needle, with the mixer-dispenser syringe housing and its two valve-seal members defining a mixing chamber containing a first medication ingredient;

a carrier syringe including a housing having an outlet end and an inlet end, a fill needle projecting outwardly from the outlet end of the housing, a discharge valve-seal member normally sealing the outlet end of the housing, and a piston-seal member normally sealing the inlet end of the housing, with the carrier syringe housing, the piston member, and the discharge valve-seal member defining a storage chamber containing a second medication ingredient;

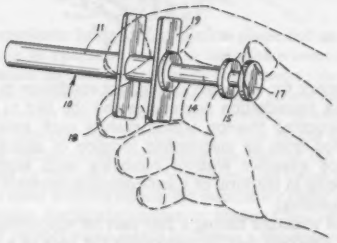
and connecting means, comprising a connecting sleeve, for releasably connecting the outlet end of the carrier syringe to the inlet end of the mixer dispenser syringe with the fill needle aligned with the inlet valve-seal member of the mixer-dispenser syringe, but permitting movement of the two syringes together to engage the fill needle with the inlet valve-seal member of the mixer-dispenser syringe for discharge of the second medication ingredient into the mixing chamber without requiring removal of the sleeve; the connecting sleeve being a length of tubing of flexible material which includes a normally closed vent aperture which is opened whenever the two syringes are moved together sufficiently to engage the fill needle with the inlet valve-seal member of the mixer-dispenser syringe.

4,060,083

PILL GUN

Raymond L. Hanson, State Highway 8, Lindstrom, Minn. 55045

Filed Apr. 1, 1976, Ser. No. 672,799
Int. Cl.² A61D *7/00*; A61M *31/00*
U.S. Cl. 128—223 **6 Claims**



1. A hand held pill gun for administering medicinal pills and capsules to small animals such as cats, comprising:

an elongate and stiff barrel having an open and blunt front end to receive and carry such a pill therein;

a pill discharging plunger slidable in the barrel to engage and eject the pill and having a thumb piece adjacent the rear end of the barrel for moving the plunger and pill; and

means for holding the fingers of the hand in close grasping contact with the barrel while administering such pills and comprising a pair of broad surfaced manipulating bars mounted on the barrel adjacent the rear end thereof, said bars extending transversely of the barrel and outwardly from the barrel in both directions and in planes lying transversely of the longitudinal center line of the barrel, each of the bars having a breadth of the same order as the width of the barrel, the bars being spaced from each other on the barrel and having broad flat surfaces confronting each other to bear against and grip the front and rear faces of adjacent fingers of the hand for efficient manipulation of the gun, one of the bars movably and snugly engaging the barrel and being forcibly movable longitudinally along the barrel to hold the fingers on the barrel.

4,060,084

METHOD AND THERAPEUTIC SYSTEM FOR PROVIDING CHEMOTHERAPY TRANSDERMALLY

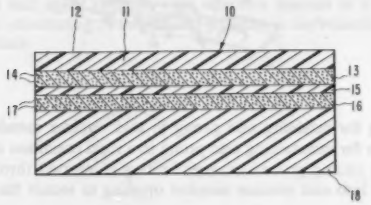
Santosh Kumar Chandrasekaran; John Urquhart, both of Palo Alto, and Jane Elizabeth Shaw, Atherton, all of Calif., assignors to Alza Corporation, Palo Alto, Calif.

Continuation-in-part of Ser. No. 721,602, Sept. 7, 1976, Pat. No. 4,031,894, which is a continuation-in-part of Ser. No. 638,947, Dec. 8, 1975, abandoned, which is a continuation-in-part of Ser. No. 547,504, Feb. 6, 1975, abandoned. This application Jan. 28, 1977, Ser. No. 763,314

The portion of the term of this patent subsequent to June 28, 1994, has been disclaimed.

Int. Cl.[2] A61M *31/00*

U.S. Cl. 128—260 10 Claims



1. Method for providing chemotherapy transdermally comprising:

a. administering a priming dose of a drug to a predetermined area of unbroken skin, said drug being (i) indicated systemically for said therapy at a predetermined systemic concentration and (ii) capable of permeating through said predetermined area of skin at a rate that produces a steady-state systemic concentration of the drug at least about equal to said predetermined systemic concentration, with the proviso that the ratio of said rate on an hourly basis to the quantity of drug immobilized by said predetermined area of skin is less than about 10, wherein the quantity of the drug in the priming dose is at least a substantial portion of said quantity of drug immobilized by said predetermined area of skin; and

b. thereafter administering the drug to said predetermined area of skin continuously at a rate that maintains the steady-state systemic concentration of the drug at about said predetermined systemic concentration.

4,060,085

DIAPER TAPE FASTENER

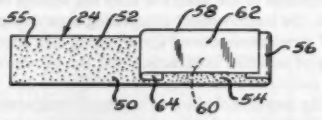
Hamzeh Karami, Crystal Lake, Ill., assignor to Colgate-Palmolive Company, New York, N.Y.

Filed Feb. 2, 1976, Ser. No. 654,241

The portion of the term of this patent subsequent to Apr. 6, 1993, has been disclaimed.

Int. Cl.[2] A61F *13/16*

U.S. Cl. 128—287 26 Claims



1. A disposable diaper, comprising:

an absorbent pad assembly having an absorbent pad, opposed first and second surfaces, at least one side edge, and opening means extending through the pad assembly including said pad, said opening means being spaced from said side edge; and

a tape fastener comprising.

a pressure-sensitive tape strip having a first end section secured to the first surface of the pad assembly with adhesive on the first end section being exposed through said opening means of the pad assembly, and a second securement section extending past said side edge of the pad assembly, and

a sheet having a first surface and a second surface facing the second surface of the pad assembly, with said adhesive exposed through the opening means being fixedly attached to the sheet.

4,060,086

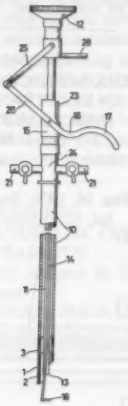
ENDOSCOPE WITH AN OPERATING DEVICE

Karl Storz, Auf dem Schildrain 39, 7200 Tuttlingen, Germany

Filed May 24, 1976, Ser. No. 689,560

Int. Cl.[2] A61B *17/32*

U.S. Cl. 128—303.15 4 Claims



1. An endoscope comprising a tubular shaft, an electrode in said shaft arranged to be supplied with high frequency current, a distal end on said shaft terminating in an outer tubular insulated portion, said distal end also including an inner tubular layer of material having a higher heat resistance than said insulated portion provided on the interior of said outer tubular insulated portion said inner tubular layer terminating in an end edge, and means for moving aid electrode longitudinally in said shaft whereby said electrode is operable with said end edge upon movement thereof to perform operations.

4,060,087

SINGLE OR DOUBLE-SHANK CUTTING LOOP DEVICE FOR RESECTOSCOPES

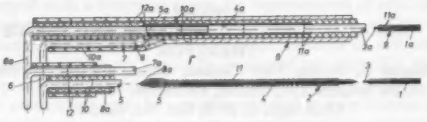
Siegfried Hiltebrandt, and Ludwig Bonnet, both of Knittlingen, Germany, assignors to Richard Wolf GmbH, Knittlingen, Germany

Filed June 11, 1976, Ser. No. 694,990

Claims priority, application Germany, June 11, 1975, 2525982

Int. Cl.[2] A61B *17/32*

U.S. Cl. 128—303.15 5 Claims



1. An electrical surgical instrument for resection, comprising:

a. shank means having a proximal and a distal end and comprising two arms each having insulation along the length thereof,

b. two parallel wires respectively carried in the insulation and terminating in two parallel single cutting loops of wire supported by said arms at the distal end of the shant means, remote from the surgeon, said cutting loops lying respectively in planes spaced a predetermined distance from each other normal to the axis of the shank means and

c. means for connecting said cutting loops to a high frequency current source, including;

i. two conductors, each connected to a respective one of said cutting loops and passing through a respective one of said arms, and

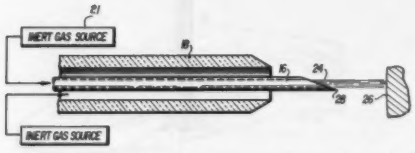
ii. two conductive contacts carried by said shank means at the opposite proximal end thereof, and each connected to a respective one of said conductors, whereby the more proximal of said cutting loops can be connected to the live pole of said high frequency source and the more distal of said cutting loops can be connected to the neutral pole of said source.

4,060,088

ELECTROSURGICAL METHOD AND APPARATUS FOR ESTABLISHING AN ELECTRICAL DISCHARGE IN AN INERT GAS FLOW

Charles F. Morrison, Jr.; Frank W. Harris, and Michael D. Patzer, all of Boulder, Colo., assignors to Valleylab, Inc., Boulder, Colo.

Filed Jan. 16, 1976, Ser. No. 649,725
Int. Cl.² A61B *17/36*
U.S. Cl. 128—303.17 **17 Claims**



17. An electrosurgical method for coagulating tissue by fulguration with an instrument comprising a support; a tubular electrode supported by said support and outwardly extending therefrom; and a hollow, electrically insulative tube disposed about said electrode and supported by said support, said method being performed by a person and comprising the steps of

directing inert flowing gas through said tubular electrode and said electrically insulative tube and outwardly therefrom;

applying high frequency electrical energy to said electrode; and

said person gripping said instrument and placing a finger on said tube and positioning the instrument adjacent the tissue to be coagulated whereby an auxiliary electrical discharge is established between the inner surface of said electrically insulative tube and said tubular electrode to thereby initiate a primary electrical discharge from the end of the electrode to said tissue and hence effect the coagulation thereof.

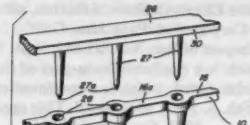
4,060,089

SURGICAL FASTENING METHOD AND DEVICE THEREFOR

Douglas G. Nolles, New Canaan, Conn., assignor to United States Surgical Corporation, Baltimore, Md.

Filed Sept. 3, 1975, Ser. No. 609,949
Int. Cl.² A61B *17/12, 17/08*
U.S. Cl. 128—325 **11 Claims**

1. A surgical fastening device comprising, in combination, a retaining member of absorbable material having an opening therein and arranged to be positioned on one side of body tissue, a fastener member of absorbable material having a prong thereon arranged to be inserted through the tissue disposed between said members and into said retainer member opening to the extent that the tissue is secured between said fastener member and said retainer member, means on said



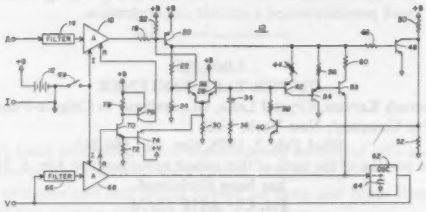
prong for retaining said prong in said retainer member, and means for maintaining said prong in a rigid condition during a tissue joining procedure as the prong is inserted through the tissue into said retainer member opening to secure the tissue.

4,060,090

VARIABLE P-R INTERVAL PACEMAKER

Heh-Sen Lin, Brooklyn Center, Minn., and John M. Adams, Mesa, Ariz., assignors to Medtronic, Inc., Minneapolis, Minn.

Filed Mar. 4, 1976, Ser. No. 663,690
Int. Cl.² A61N *1/36*
U.S. Cl. 128—419 PG **10 Claims**



1. In a cardiac pacemaker having means for providing an electrical stimulus to the ventricle after the sensing of an atrial contraction, the improvement comprising means responsive to the rate of atrial contractions for affecting the time between the sensing of an atrial contraction and the provision by said providing means of said electrical stimulus to the ventricle, said affecting means including a two input comparator circuit, a first input circuit coupled to one comparator input for maintaining that one input at a reference value and a second input circuit for providing a value to be compared with said reference value to the other input of said comparator circuit, said second input circuit including a variable value providing means for providing a value which increases at a first rate to said reference value from the time each atrial contraction is sensed and which decreases at a second rate from each time said reference value is reached until the next atrial contraction is sensed.

4,060,091

TOBACCO AND TOBACCO-CONTAINING MANUFACTURES CONTAINING AN INGREDIENT HAVING PHYSIOLOGICAL COOLING ACTIVITY

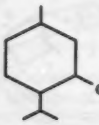
Hugh R. Watson, Wargrave; David G. Rowsell, Staines, and David John Spring, Datchet, all of England, assignors to Wilkinson Sword Limited, London, England

Continuation-in-part of Ser. No. 221,755, Jan. 28, 1972, abandoned. This application July 8, 1974, Ser. No. 486,565

Int. Cl.² A24B *3/12*

U.S. Cl. 131—9 **10 Claims**

1. A tobacco or tobacco-containing manufacture comprising tobacco and an agent capable of stimulating the cold receptors of the nervous system of the nasal or oral mucosa when brought into contact therewith upon use of the manufacture, wherein said agent comprises an effective amount of a cold receptor stimulating N-substituted p-methane carboxamide of the formula:



Where

R', when taken separately, is hydrogen or an aliphatic radical containing up to 25 carbon atoms and selected from alkyl, cycloalkyl, cycloalkylalkyl, hydroxyalkyl, alkynyl, hydroxyalkynyl, acyloxyalkyl, alkoxyalkyl, aminoalkyl, acylaminoalkyl, calboxyalkyl and alkylcarbonyalkyl;

R", when taking separately, is hydroxy, or an aliphatic radical containing up to 25 carbon atoms and selected from alkyl, cycloalkyl, cycloalkylalkyl, hydroxyalkyl, alkynyl, hydroxyalkynyl, acyloxyalkyl, alkylcarbonyalkyl, with the proviso that when R' is hydrogen R" may also be an aryl radical of up to 10 carbon atoms and selected from the group consisting of benzyl, pyridyl, and substituted phenyl wherein the substituents are selected from C_1– C_4 alkyl, hydroxy, C_1 – C_4 alkoxy, nitro and halogen; and

R' and R", when taken together with the nitrogen atom to which they are attached, represent a cyclic or heterocyclic group of up to 25 carbon atoms.

4,060,092

ASHTRAY AND EXTINGUISHER

James Pappas, 11576-72 Avenue, Delta, British Columbia, Canada

Filed Sept. 27, 1976, Ser. No. 726,493

Int. Cl.² A24F *13/18, 19/14*

U.S. Cl. 131—236 **7 Claims**

1. An ashtray and extinguisher comprising:

a. a first container including a bottom portion and side portion forming a chamber including a mouth portion;

b. a grid element adapted to rest on said mouth portion of said chamber and a multiplicity of radially arranged wires in a somewhat pyramidal arrangement emanating upwardly from a first central ring portion on one end to an outer frame portion on the other end, said frame portion adapted to rest on said mouth;

c. a second container including a bottom element and side elements forming a cavity and an upper opening and adapted to contain an extinguisher liquid therein;

d. a shield element removably affixed to said upper opening of said cavity having a substantially trapeqoidally shaped surface having a central opening at the small end thereof, said surface being sloped upwardly from said central opening, a second ring element affixed to said central opening, the upper marginal edges of said second ring element extending upwardly from a portion of said surface adjacent said second ring element; and

e. a rigid unitary housing including a first and second cavity, said first cavity adapted to removably contain said first container therein and said second cavity adapted to removably contain said second container therein, said first cavity and said second cavity being accessible from the top of said housing, said mouth portion of said first container being disposed level with an open mouth portion of said first cavity, said first container being larger in size than said second container, wherein the top of said second container is lower than the top of said first container.

4,060,093

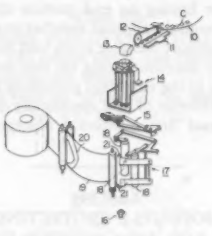
COIN STACKER IN AUTOMATIC COIN WRAPPING APPARATUS

Syugo Douno, Himeji, Japan, assignor to Glory Kogyo Kabushiki Kaisha, Himeji, Japan

Continuation of Ser. No. 230,818, March 1, 1972, abandoned. This application June 17, 1976, Ser. No. 697,217

Int. Cl.² G07D *9/06*

U.S. Cl. 133—1 A **15 Claims**



1. In a coin stacking device adapted for a coin wrapping apparatus in which coins fed from a coin supply passage are stacked at a coin stacking means comprising a plurality of coin guide members each of which has a coin guide surface and a diameter-adjusting means adapted for adjusting the inner diameter of a coin stacking space inscribed by said coin guide surfaces, a lower part of said coin stacking means being opened after a predetermined number of coins are stacked in said coin stacking space thereby to transmit said coin stack into a coin wrapping position and then the thus transmitted coin stock is wrapped with a wrapping sheet; the improvement of said coin stacking means and said diameter-adjusting means, said impro vement residing in that said coin guide surfaces of said coin stacking members are vertically elongated and mutually, partially, and mutual-slidably overlapped at their adjoining side wall positions so as to be mutually slid and to form therein an adjustable coin stacking space having a substantially polygonal cross-section, said coin stacking means comprising a coin-stack mounting means having a coin mounting surface adapted to open or close the bottom face of said coin stacking space and to mount thereon a coin stack stacked in said space when said bottom face is closed, said mounting surface being adapted to be moved along a lower part of said coin guide members so as to open the same to transfer a coin stack to the coin wrapping

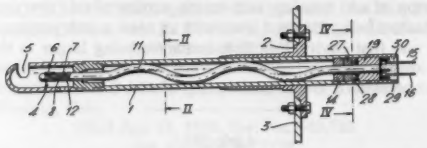
apparatus after a predetermined number of coins are stacked in said coin stacking space; and said diameter-adjusting means comprises a support means for adjustably supporting said coin guide surfaces of said coin guide members in parallel to the vertical-axis of said coin stacking space thereby to vary the diameter of the inscribed circle of said polygonal cross-section of said space so as to conform to the diameter of coins to be processed.

4,060,094

ELECTRICAL-INTERCONNECTION ASSEMBLIES AND METHODS OF FORMING INTERCONNECTIONS THEREIN

Kenneth G. McAinsh, Frimley, England, assignor to Smiths Industries Limited, London, England

Filed Nov. 26, 1975, Ser. No. 635,490
Int. Cl.[2] H01V *1/02*
U.S. Cl. 136—230 11 Claims



1. An electrical-interconnection assembly comprising two electrical conductors, a support member fabricated of electrically-insulative material, said support member having an end face and being operative to support said two conductors, a first of the two conductors extending from a first direction into and through the support member to emerge from said end face, and the second conductor extending into said support member from a second direction opposite to said first direction, said second conductor having an end portion thereof that turns back on itself through the support member to emerge from said end face of the support member from said first direction, and means electrically interconnecting the said end portion of said second conductor to the emergent portion of said first conductor at a position exterior of said electrically-insulative support member where said first conductor emerges from said end face.

4,060,095

THERMOCOUPLE PROTECTING TUBE

Sumihiko Kurita, Arita, Japan, assignor to Koransha Co., Ltd., Japan

Filed Aug. 17, 1976, Ser. No. 715,023
Claims priority, application Japan, Aug. 23, 1975, 50-116346[U]; Sept. 1, 1975, 50-106144[U]; Feb. 10, 1976, 51-13800; Feb. 10, 1976, 51-14939[U]; Feb. 12, 1976, 51-15519[U]
Int. Cl.[2] H01L *35/02*
U.S. Cl. 136—234 5 Claims

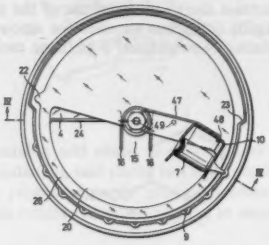
1. A thermocouple protecting tube comprising an inner ceramic tube having one end closed and containing a thermocouple element therein, and a thermal-shock resistant outer means disposed concentrically over said inner ceramic tube and over said one closed end of said inner tube, said outer means being a mixed body of high refractory powder of 100 parts by weight and aluminum phosphate of 7 to 200 parts by weight.

4,060,096

VENTILATOR VALVE

Max Gunter Schade, Parkstrasse 36, Bensberg, Germany (5060)

Filed June 25, 1976, Ser. No. 699,625
Claims priority, application Germany, July 2, 1975, 2529579; Nov. 27, 1975, 2553364
Int. Cl.[2] F16K *13/04, 17/40*
U.S. Cl. 137—74 26 Claims



1. A ventilator valve comprising a housing, means defining a flow passage through said housing at least a portion of which is defined by an aperture in a plate incorporated in said housing, a valve plate mounted for rotation in a plane adjacent to the plane of said plate which includes said aperture, said valve plate having at least one aperture adapted to be selectively positioned with respect to the aperture in said first mentioned plate, means for mounting a locking element in connection with said valve plate, for rotation therewith, means having a relatively fixed relation to said housing including a plurality of arcuately spaced anchoring means adapted to be selectively engaged by the locking element whereby to position a selected portion of said one aperture in said rotatable plate in alignment with a selected portion of the aperture in said first mentioned plate, the locking element mounted in connection with said valve plate and the anchoring means to which it is engaged being arranged to disengage in the presence of a predetermined level of the temperature of their environment, and said rotatable plate being conditioned to move to a position to close said aperture in said first mentioned plate upon a disengagement of the locking element from its anchoring means.

4,060,097

AUTOMATIC ETCHING SYSTEM

Keith E. Oxford, 4010 Paducah Drive, San Diego, Calif. 92117

Continuation of Ser. No. 614,072, Sept. 17, 1975, abandoned.
This application Apr. 4, 1977, Ser. No. 784,236
Int. Cl.[2] C23F *1/02*
U.S. Cl. 137—[illegible]3 6 Claims

1. For use with an etching machine, an etchant regenerating system for automatically monitoring and regenerating etchant, said system comprising:

means for circulating sample of etchant along a flow path,

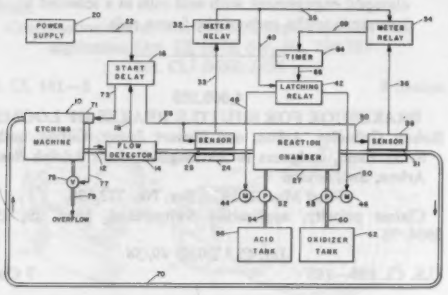
constituent component adding means for selectively adding a selected one of two constituent components to said flow path,

first monitoring means upstream of said adding means for monitoring changes in the etchant composition and responsive upon monitoring etchant deficiency of a constituent component thereof for activating said constituent adding means,

second monitoring means downstream of said adding means for monitoring changes in the etchant,

said adding means responsive to said second monitoring means for selectively adding alternate ones of said constit-

uent components into the etchant for a predetermined period of time until an improvement in the etchant quality is monitoring by said second monitoring means at which time selection of the improving constituent is maintained, and said first monitoring means maintaining the adding means in the addition mode until the etchant quality falls between preselected parameters,



said first monitoring means comprises a light sensing means for sensing the intensity of light rays passing through a sample of the etchant,

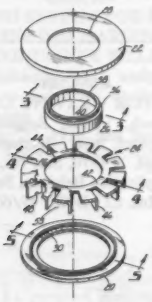
said second monitoring means comprises light sensing means for sensing the intensity of light rays passing through a sample of the etchant downstream of the constituent component adding means.

4,060,098

VALVE PLATE CONSTRUCTION

James D. Bares, Woodstock Road, Gates Mills, Ohio 44040, and William P. Burke, Jr., 7665 Chesterbrook Road, Chesterland, Ohio 44024

Filed Dec. 22, 1975, Ser. No. 643,181
Int. Cl.² F16K *15/08*
U.S. Cl. 137—594 **6 Claims**



1. A method of forming a valve plate assembly for a compressor comprising the steps of:

providing first and second annular end plates, a spacer plate having a central opening and means to define radial passages, and a central locating collar, said means defining said radial passages including radially extending leg means and means for axially aligning said plates and collar along a central longitudinal axis

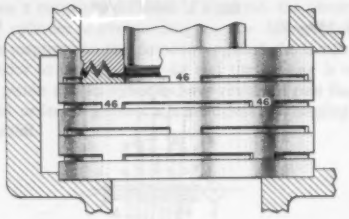
assembling said plates and said collar with the spacer plate interposed between said end plates and defining with said end plates a plurality of radially extending passages and with said collar disposed internally of said spacer plate and all maintained in axial alignment along said axis, said collar having a central opening defining an axial central bore around said axis, and said collar having wall means, and thereafter interconnecting said plate and said collar in their assembled position with the wall means of the collar and the spacer plate and said end plates defining an annular opening communicating with said radial passages.

4,060,099

CONTROLLED PRESSURE DROP VALVE

Charles L. Bates, Jr., P.O. Box 100C, Springville, Utah 84663

Continuation-in-part of Ser. No. 444,524, Feb. 21, 1974, Pat. No. 3,977,435. This application Jan. 3, 1975, Ser. No. 538,450
Int. Cl.² F16K *47/08*
U.S. Cl. 137—625.3 **4 Claims**



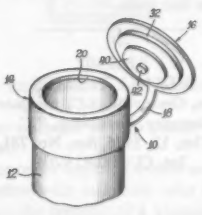
1. A circular disk for stacking in register with similar disks in a valve body to provide an extended flow-resistant surface area comprising a disk having a central annular opening, a circular outer perimeter with each facial surface having a plurality of concentric annular ridges thereon and having interlocking means to hold said disk in register with and to space said disk from an adjacent disk, said interlocking means comprises an outer rim which encircles the outer perimeter of said disk to form an overlapping means to overlap an adjacent disk.

4,060,100

CLOSURE FOR CYLINDRICAL PIPE

Gerald V. Miller, 125 Adams Drive, and David W. Zeh, 63 Oak St., both of, Addison, Ill. 60101

Filed May 10, 1976, Ser. No. 684,536
Int. Cl.² F16L *55/10*
U.S. Cl. 138—89 **6 Claims**



1. A closure for covering and providing access to the interior of a cylindrical pipe or the like comprising:

a nonmetallic resilient cap portion having a generally cylindrical shaped side wall, the inside surface of which is adapted to fittingly engage the outside of said pipe, the top of said cap portion having an inwardly directed flange integrally formed with said wall, said flange being in overlying relation to the end of said pipe and having a circular aperture defined by the inside of said flange, said flange forming a seat into which a cover portion of said closure can be snugly engaged;

a nonmetallic resilient cover portion adapted to overlie said cap portion for covering said aperture, said cover portion being generally circular and having an outside diameter generally coextensive with said side wall, said cover portion having a transverse cylindrical extension the outer diameter of which is substantially similar to the inside

diameter of said aperture, said extension snugly engaging said aperture when said cover portion is applied to said cap portion to cover said aperture; and,

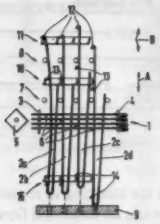
a ferromagnetic member attached to the underside of said cylindrical extension of said cover portion.

4,060,101

DOUBLE LIFT, OPEN SHED JACQUARD LOOM

Wolfgang Seiler, Munchen-Gladbach, Germany, assignor to Firma Oskar Schleicher, Munchen-Gladbach, Germany

Filed July 8, 1976, Ser. No. 703,701
Claims priority, application Germany, July 10, 1975, 2530799
Int. Cl.[2] D03C *3/08*
U.S. Cl. 139—65 11 Claims



1. A double lift, open shed Jacquard comprising:

a plurality of hooks controlled by control needles;

first and second mutually parallel, opposed, vertically spaced apart sets of knives;

a Jacquard prism for controlling said needles;

lifting means for lifting said first and second sets of knives toward and away from one another without crossing;

transverse guide means for producing a transverse component of movement toward said Jacquard prism in both up and down directions of lift of said upper set of knives, said transverse component of movement occurring between upper and lower centers of movement of said upper set of knives; and

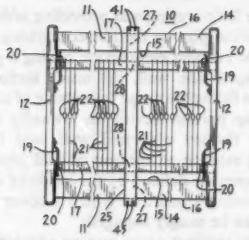
straight line guide means for guiding the lower set of knives along a straight line path.

4,060,102

HEDDLE FRAMES

Frank H. Kaufmann, Greenville, S.C., assignor to Steel Heddle Manufacturing Company, Greenville, S.C.

Filed Oct. 12, 1976, Ser. No. 731,736
Int. Cl.[2] D03C *9/06*
U.S. Cl. 139—91 8 Claims



1. In a heddle frame having top and bottom frame rails and heddle supporting rods inwardly of said rails, the means for bracing said rails which comprises

a brace extending between said rails and having separable portions with their ends in surrounding relation to and in engagement with said rails,

said brace ends having sockets for engagement with said frame rails,

said brace portions inwardly of said frame rails having sockets for engagement with said heddle supporting rails, and

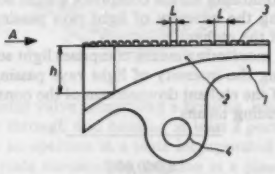
fastening members for retaining said separable portions in clamped engagement with said rails at a selected location intermediate the ends of the frame rails.

4,060,103

BRAKESHOE FOR SHUTTLE BRAKES OF LOOMS

Robert Gründler, Arbon, and Hubert Jenny, Gotzis, both of Switzerland, assignors to Aktiengesellschaft Adolph Saurer, Arbon, Switzerland

Filed Mar. 2, 1977, Ser. No. 773,524
Claims priority, application Switzerland, Mar. 29, 1976, 3904/76
Int. Cl.[2] D03D *49/54*
U.S. Cl. 139—185 7 Claims



1. A brakeshoe for shuttle brakes of looms upon which cloth is woven comprising:

a. a rigid arcuate shaped support member; and

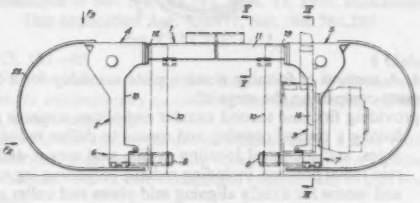
b. a resilient lining carried on said arcuate shaped support member having a resilience which decreases progressively with the distance from a front end of said lining facing the selvage of said cloth being woven on said loom towards the remote end.

4,060,104

SLAY FOR WEAVING LOOMS

Patrick A. Steverlynck, Vichte, Belgium, assignor to N.V. Weefautomaten Picanol, Ieper, Belgium

Filed Sept. 7, 1976, Ser. No. 720,592
Claims priority, application Belgium, Sept. 19, 1975, 7511123
Int. Cl.[2] D03D *49/60*
U.S. Cl. 139—188 R 5 Claims

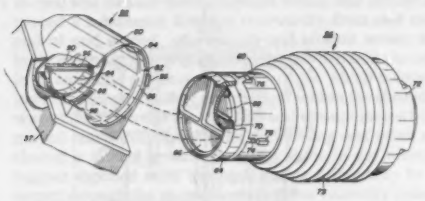


1. Improved slay for weaving looms, having a frame supporting a slay itself and two slay swords, characterized by the fact that at least the slay swords are hollow structures with the head of each slay sword attached to the corresponding end of the slay and along the extension of same, the width of slay swords being greater than that of the slay itself, the slay swords being secured to the outer sides of said frame.

4,060,105
TONER LOADING APPARATUS WITH REPLENISHING SUPPLY CONTAINER

Ronald F. Feldeisen, Fairport; John A. Minchak, Wesbter, both of N.Y.; Richard B. Gerstman, Tenafly, N.J.; Herbert M. Meyers, New Rochelle, and Richard C. Edstrom, New York, both of N.Y., assignors to Xerox Corporation, Stamford, Conn.

Continuation of Ser. No. 612,529, Sept. 11, 1975. This application Oct. 22, 1976, Ser. No. 734,787
Int. Cl.[2] B65B *1/06*
U.S. Cl. 141—1 5 Claims



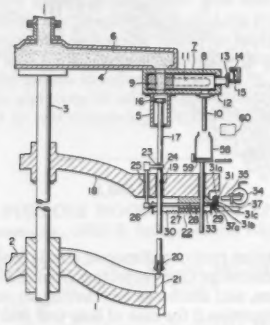
5. An improved method for adding toner to a toner hopper in an electrostatic reproduction machine by moving the tone from a toner bottle through an outlet opening in one end of the toner bottle and through an inlet opening in the toner hopper, wherein the improvement comprises the steps of:

a. positioning the one end of the bottle in a predetermined position over the inlet opening in the hopper;
b. rotating a portion of the bottle to simultaneously open the outlet opening and lock the bottle onto the hopper;
c. stopping the rotation of the bottle portion when the openings are aligned and the outlet opening is completely opened by rotating the bottle portion until a lug on the bottle portion contacts a lug on the toner hopper; and
d. compressing the bottle to expel toner through the aligned openings.

4,060,106
METHOD AND SYSTEM FOR PREVENTING CONTAINERLESS DISCHARGING OF FILLING MATERIAL IN CONTAINER FILLING APPARATUS

Kenji Takasuga, Yokohama, Japan, assignor to Kewpie Kabushiki Kaisha, Tokyo and Toyo Shokuhin Kikai Kabushiki Kaisha, both of, Japan

Filed May 21, 1976, Ser. No. 688,788
Int. Cl.[2] B65B *3/04*
U.S. Cl. 141—1 7 Claims

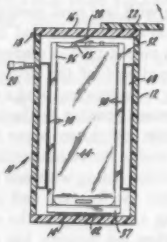


1. In a method of filling successively a prescribed quantity of a fluid material into respective containers by means of a plurality of charging cylinders arranged in a circle around a vertical main shaft to revolve therearound and having respective pistons while precluding discharge of the fluid material in the absence of a container to be filled, each of the cylinders being adapted to introduce thereinto the fluid material from a header chamber during the intake stroke of the piston thereof and then to discharge its filled material into a corresponding container during the discharge stroke of the piston, passageways of the introduction and discharge of the fluid material being established through a switching valve member, and switching of the valve member and reciprocal stroke of the cylinder piston being caused in relation to the revolution of the charging cylinders, an improvement in the preclusion process for discharge of the fluid material in the absence of a container to be filled comprising when the absence of a container at a filling position on a container platform is detected, the piston of the charging cylinder corresponding to the filling position is locked in response to the detection against the intake stroke thereof prior to the intake stroke and the locking is released after the piston and its cylinder have revolved past the filling position in order to prevent containerless discharging of the fluid material.

4,060,107
METHOD AND APPARATUS FOR COLLECTING FLUIDS

Henry Naftulin, 8341 N. Kenton Ave., Skokie, Ill. 60076

Filed Oct. 26, 1976, Ser. No. 735,764
Int. Cl.[2] B65B *31/02*; A61M *1/00*
U.S. Cl. 141—7 7 Claims



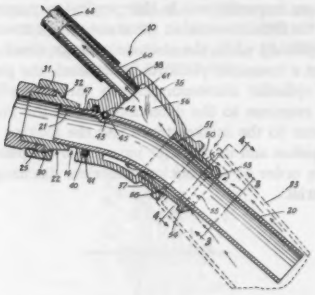
1. Apparatus for collecting and storing biological fluids, comprising:

a. a rigid outer chamber having a fluid inlet opening and a vacuum port;
b. a flexible container disposed within said outer chamber in communication with said fluid inlet for receipt of fluid therein upon the creation of a vacuum within said outer chamber through said vacuum port;
c. inner chamber means disposed within said outer chamber for receipt of said flexible container therein, said inner chamber means being split into at least two sections which are movable between a closed position and an open position, said inner chamber means defining a smaller volume when in its closed position than when in its open position; and
d. bladder means disposed within said outer chamber between said inner chamber means and said outer chamber, the interior of said bladder means being in communication through an opening in said outer chamber with the atmosphere so as to cause said bladder means to expand and fill the space between said inner chamber and said outer chamber upon the application of a vacuum to said outer chamber so as to exert a pressure on said inner chamber sections and thereby move said sections toward one another into its closed position.

4,060,108
VAPOR CONTROL SPOUT

Paul George Weston, La Crescenta, Calif.; Glenn A. Jennemann, St. Louis, Mo., and Thomas Kemp Hutchinson, Godfrey, Ill., assignors to Milton D. Hartman, St. Louis, Mo.

Filed Jan. 9, 1976, Ser. No. 647,911
Int. Cl.[2] B65B *31/06*
U.S. Cl. 141—59 8 Claims



1. A spout for a gasoline nozzle comprising a curved, rigid tube, an inlet end of the tube having means for attachment to the outlet end of a nozzle, an outlet end of the tube being adapted to extend into the mouth of a fill tube of a vehicle fuel tank, a rigid housing surrounding said tube, said housing having a rearward end, a forward end, and a vapor outlet port, said housing defining with an outer wall of said tube a vapor receiving chamber therebetween, said chamber having passage means communicating with said port, means providing sealing engagement of the rearward end of said housing about said tube at a first position on the tube, a wedge sleeve adjustably engaged to the forward end of the housing for movement relative to the housing to engage and bind a rear sleeve portion against the tube at a second position on the tube forward of the first position on the tube and curved away from the first position on the tube, said wedge sleeve having an engaging surface in a forward sleeve portion acting with said rear sleeve portion on said tube to support the forward end of said housing on the tube, said engaging and binding at the second position on the tube occurring when the housing has said rearward end sealingly engaged about the tube at said first position on the tube, said wedge sleeve having means forming a vapor passage between said sleeve and said tube to communicate said vehicle tank with said chamber.

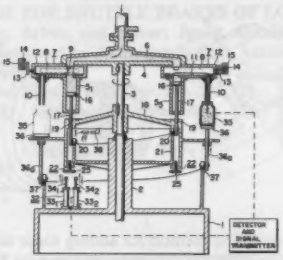
4,060,109
FILLING QUANTITY REGULATING SYSTEM IN CONTAINER FILLING APPARATUS

Koichi Sotoma, Yokohama, Japan, assignor to Kewpie Kabushiki Kaisha, Tokyo and Toyo Shokuhin Kikai Kabushiki Kaisha, Kanagawa, both of, Japan

Filed May 14, 1976, Ser. No. 686,262
Int. Cl.[2] B65B *3/28, 3/32*
U.S. Cl. 141—83 9 Claims

1. In a container filling apparatus comprising a plurality of charging cylinders arranged in a circle around a vertical main shaft so as to revolve thereabout and provided with respective pistons for pushing out the material supplied into said cylinders to fill respective containers, a limiting adjusting mechanism provided for each of said charging cylinders and adapted for setting adjustably the limit end of the intake stroke of the piston in each charging cylinder, thereby to adjust the quantity of the material to be filled into each container, an actuating device for adjustably actuating said limit adjusting mechanism, and driving means for activating said actuating device thereby to cause adjustable operation of said limit adjusting mechanism, the improvement of said limit adjusting mechanism, said actuating device and said driving means:

said limit adjusting mechanism comprising a finely adjustable adjusting screw having a contact surface of one end thereof and engaged with a structural part secured integrally with and revolving unitarily with the corresponding charging cylinder, and a rotation transmitting wheel having sprocket-like teeth and fixed to the other end of said adjusting screw, said contact surface being adapted for abutment against the end part of a piston rod secured to the piston of said cylinder;



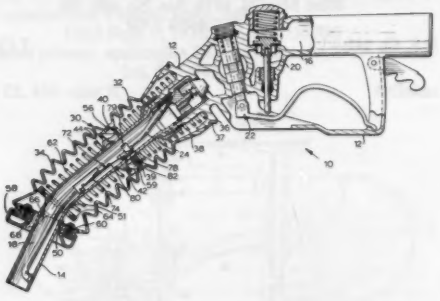
said actuating device comprising at least one pair of actuating members respectively disposed on opposite sides of the orbital path of revolution of said rotation transmitting wheel and adapted to be driven into engagement respectively with one sprocket-like tooth, thereby to turn said wheel respectively in clockwise or counterclockwise directions by an angular displacement corresponding to one tooth thereof; and

said driving means being adapted for driving said actuating members into and out of said engagement.

4,060,110
VAPOR RECOVERY NOZZLE

Allen M. Bower, Conneaut, Ohio, assignor to Emco Wheaton Inc., Conneaut, Ohio

Filed Sept. 30, 1976, Ser. No. 728,378
Int. Cl.[2] B65B *31/00*; B67C *3/28*
U.S. Cl. 141—207 15 Claims



1. In a vapour recovery dispenser nozzle having a main body portion, a discharge tube projecting from one end of the main body portion, said discharge tube having an outer end portion thereof proportioned for ease of insertion into a filling tube of a liquid storage tank, a liquid flow passage extending through said main body and said discharge tube, vapour recovery passage means formed in said main body, an extensible vapour recovery shroud having an inner end and an outer end, said inner end of said shroud being mounted on said main body and communicating with said vapour recovery passage means of

said main body, said shroud being disposed radially outwardly from said discharge tube and being movable between an extended position and a retracted position with respect to said main body, said shroud being normally urged towards said extended position, a first sealing collar at the outer end of said shroud for engagement with the end of the filling tube of a gas tank during filling thereof to direct vapour which is expelled from the tank to the vapour recovery passage means in the main body by way of the shroud, the improvement of

a. sealing seat means on said discharge tube, said sealing seat means being located rearwardly from said outer end portion of said discharge tube to be disposed outwardly from the end of the filling tube of a liquid storage tank in use,

b. second seal closure means disposed within said shroud and spaced a substantial distance rearwardly from said outer end of said shroud, said second seal closure means sealingly engaging said sealing seat means when said shroud is in its extended position whereby vapour which is located inwardly thereof cannot escape from within the shroud by way of the outer end thereof, said seal closure means being moved rearwardly away from said sealing seat when said shroud is moved to its retracted position in use whereby vapour expelled from the tank during filling may be directed through the shroud to the vapour recovery passage means of the main body.

4,060,111

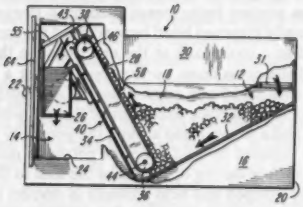
VENDING AND DISPENSING BIN

Howard L. Burks, Dunedin, Fla., assignor to Perino B. Wingfield, Yellow Springs, Ohio, a part interest

Filed Dec. 15, 1975, Ser. No. 640,890

Int. Cl.² B65B *3/00*; B65G *11/18*; G01F *11/20*

U.S. Cl. 141—231 **16 Claims**



1. Vending and dispensing apparatus comprising a housing including a bin portion and a dispensing portion, said bin portion accommodating material to be dispensed as separated individual elements and existing in said bin in a manner form in which individual elements tend to adhere to one another, material delivery means in association with said bin portion operable to deliver said material from said bin portion to said dispensing portion and embodying means for applying twisting forces within said bin portion to influence elements of said mass of material therein to separate one from the other within said bin portion and to move said material including said separated elements to said dispensing portion for discharge from said housing.

4,060,112

MULTIPLE PURPOSE WOODWORKING APPARATUS

William E. Leeper, Jr., 3405 S. Independence, Oklahoma City, Okla. 73119

Filed May 17, 1976, Ser. No. 687,167

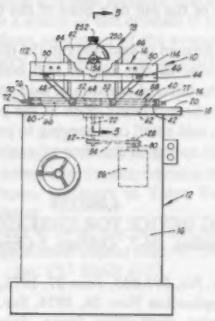
Int. Cl.² B27C *5/02*

U.S. Cl. 144—134 R **19 Claims**

1. A horizontal cutter adapter attachment for use with a universal shaper having a horizontal shaper table with a vertically journaled spindle positioned adjacent the horizontal top surface of the shaper table and drive means carried by the shaper for vertically rotating the spindle, comprising:

a table adapter assembly having a horizontal bottom surface supportable on the top surface of the shaper table, and having a workpiece supporting table with a horizontal top surface positioned intermediate said horizontal bottom surface and a power output shaft position;

a power output shaft horizontally journaled on said table adapter assembly;



means carried by said table adapter assembly for drivingly interconnecting the spindle of the shaper and said power output shaft to transmit rotational movement from the spindle to said power output shaft; and

means on said power output shaft for drivingly engaging a cutter for horizontal rotation therewith.

4,060,113

TIGHTENING DEVICE FOR THREADED SCREW PART

Ryuzo Matsushima, 36-7, Oshiage 3-chome, Sumida, Tokyo, Japan

Division of Ser. No. 591,035, June 27, 1975, Pat. No. 4,007,768.

This application Nov. 26, 1976, Ser. No. 745,288

Claims priority, application Japan, July 3, 1974, 49-78859; Nov. 21, 1974, 49-141956; May 23, 1975, 50-69483

Int. Cl.² B25B *15/00*

U.S. Cl. 145—50 D **3 Claims**

1. A driver for nut and bolt which comprises in combination:

a shank with one end portion thereof fitted to a holder or a handle;

a body having in one end part thereof an engaging socket to fit on the outer periphery of the nut or a head of the bolt, the other end portion of said shank being connected to the other end thereof;

a narrow groove formed alongside an engaging surface of said engaging socket, and extending in the direction substantially parallel to the axis of said engaging socket;

a small passage formed in said body, one end of which is blind within said body, and the other end of which communicates with said narrow groove;

a plate spring having a bent portion at the rear part thereof and a tapering surface at the tip end thereof, said spring

extending from the blind portion of said small passage up to the open end of said engaging socket along said narrow groove, the rear part of said spring being held in the blind portion of said small passage on its own resiliency to be exerted from said bent portion thereof, and the tip end of said spring projecting from said narrow groove of said engaging socket with its tapering surface to the outer periphery of the nut or a head of the bolt to be tightened; and

a small port formed in said body in the direction substantially perpendicular to the axis of said body, one end thereof meeting the blinded position of said small passage, and the other end thereof being open at the peripheral surface of said body, said small port serving to push forward the rear end of said spring at the time of exchanging said spring.

4,060,114

TIGHTENING DEVICE FOR THREADED SCREW PART

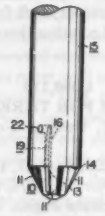
Ryuzo Matsushima, 36-7, Oshiage 3-Chome, Sumida, Tokyo, Japan

Division of Ser. No. 591,035, June 27, 1975, Pat. No. 4,007, 768. This application Nov. 26, 1976, Ser. No. 745,289

Claims priority, application Japan, July 3, 1974, 49-78859; Nov. 21, 1974, 49-141956; May 23, 1975, 50-69483

Int. Cl.² B25B *15/00*

U.S. Cl. 145—50 D **1 Claim**



1. A screw driver which comprises in combination:

a shank with one end portion thereof fitted to a holder of a handle, and with an opposite end portion thereof provided with a flat plane or surface in the direction substantially perpendicular to the axis of said shank;

an engaging means having engaging blades in the shape of the cross, or a "Plus (+)", to be engaged with a threaded screw, and projecting from said flat plane of said shank;

a narrow groove formed in the inclined surface of one of the cross-shaped blades of said engaging means at the intersection thereof along the axial direction of said shank and to the side of the forwarding or rotational direction of said screw driver;

a small passage formed in said shank, one end thereof being blind within said shank, and the other end thereof being open at said flat end surface of said shank;

a wire spring having a bent portion at the rear part thereof and a tapering surface at the tip end thereof, said spring extending from the blind portion of said small passage up to the open end of said narrow groove, the rear part of said spring being held in the blind portion of said small passage due to self-resiliency of said bent portion thereof, and the tip end of said spring projecting from said narrow groove with its tapering surface to the cross-shaped groove formed in the head part of the threaded screw; and

a small port formed in said shank in the direction substantially perpendicular to the axis of the shank, one end thereof meeting the blinded position of said small passage, and the other end thereof being open at the peripheral surface of said shank, said small port serving to push forward the rear end of said spring at the time of exchanging said spring.

4,060,115

HANDLE FOR HAND TOOLS TO BE ROTATED DURING OPERATION

Jesus Bocanegra Marquina, Burgos, Avda. Reyes, Catolicos, Edificio, Nebrija, Spain

Filed Jan. 24, 1977, Ser. No. 761,623

Claims priority, application Spain, Jan. 23, 1976, 218263

Int. Cl.² B25G *1/00*

U.S. Cl. 145—61 G **7 Claims**

1. A handle for hand tools including a shank with a tool element at one end and that must be rotated about an axis longitudinal of the shank during operation, comprising a T-shaped member including a central beam portion and a perpendicular cross-bar portion at one end of the beam portion, said central beam portion being constituted by a sleeve structure having an axially disposed blind bore adapted to receive and be rigidly fixed to a tool shank at the end opposite the tool end thereof, and the cross-beam portion constituting a handle for turning the tool, said beam portion having a smooth generally cylindrical bearing surface intermediate thereof with a bead at its free end, and a sleeve fitted around the generally cylindrical surface and retained by said bead for rotatable movement of the bearing surface during operation of the tool so that the tool can be firmly grasped and held securely in correct position by one hand of the operator grasping the sleeve while the operator uses the cross-bar handle with the other hand to rotate the handle and the tool.

4,060,116

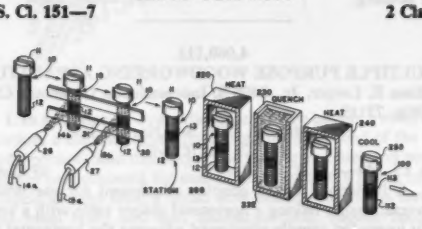
METHOD FOR PRODUCING SELF-LOCKING FASTENERS

Robert A. Frailly, Massillon, Ohio, assignor to Eaton Corporation, Cleveland, Ohio

Continuation of Ser. No. 522,976, Nov. 11, 1974, abandoned, which is a division of Ser. No. 458,370, April 5, 1974, abandoned. This application Dec. 11, 1975, Ser. No. 639,953

Int. Cl.² F16B *39/34*

U.S. Cl. 151—7 **2 Claims**



1. An improved, reusable, all metallic, self-locking threaded fastener comprising an elongated, metallic threaded portion and a relatively spongy, porous metallic patch bonded to a

selected area of said threaded portion, said patch being thicker in the thread valleys than on the adjacent thread crests, said patch extending sufficiently radially outwardly from said threaded portion to be compressed between said threaded portion and a threadably engaged complementary threaded fastener, the improvement comprising:

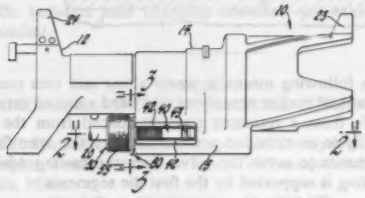
said patch having an outer surface which is substantially smoother, less porous and of greater density than the remainder of the patch.

4,060,117

INERTIAL RING LOCK

Daniel H. Chabot, Los Alamos; Robert S. Peterson, and Roy D. Plumer, both of Santa Barbara, all of Calif., assignors to General Motors Corporation, Detroit, Mich.

Filed Apr. 12, 1976, Ser. No. 676,354
Int. Cl.[2] F16B *39/00, 21/00*
U.S. Cl. 151—43 4 Claims



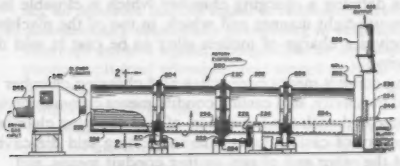
1. In combination, a threaded fastener having a head and a shank extending therefrom, said shank adjacent its free end having external threads and having an annular relief groove next adjacent said head, a body means having a threaded bore extending from one end surface thereof receiving said external threads of said threaded fastener in threaded engagement therewith and, a ring like mass loosely encircling said threaded fastener in said relief groove, said ring like mass being loosely sandwiched between said head and said one end surface of said body means when said threaded fastener is fully operatively threaded into said body means whereby said ring like mass is operative to serve as an inertia damper to prevent rotation of said threaded fastener in a loosening direction relative to said body means when said body means is subjected to vibrational and torsional loads.

4,060,118

RECOVERING CHLORIDE FLUX SALTS FOR ALUMINUM

Pandelis N. Papafingos, and Richard T. Lance, both of Riverside, Calif., assignors to Alumax Mill Products, Inc., Riverside, Calif.

Continuation-in-part of Ser. No. 658,150, Feb. 17, 1976, abandoned, and a continuation-in-part of Ser. No. 658,430, Feb. 17, 1976. This application Oct. 21, 1976, Ser. No. 734,484
Int. Cl.[2] B01D *1/22, 9/02*
U.S. Cl. 159—49 3 Claims



1. A process for recovering soluble chloride flux salts for aluminum from an aluminum dross brine comprising the steps of:

introducing the brine to an input end of a cylindrical evaporator;

introducing hot evaporator gas into the evaporator;

rotating the cylindrical evaporator to repeatedly immerse evaporating surfaces of said evaporator to form thereon a film of brine and to expose said film to said evaporator gas to thereby form salt crystals on said surfaces and immersing said salt crystal covered surfaces into a body of brine to thereby form a slurry of salt crystals in saturated brine;

removing slurry from an output of the evaporator; and

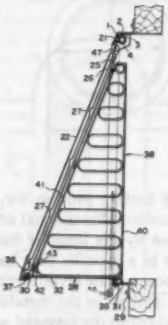
separating the slurry into salt crystal product and saturated brine.

4,060,119

SHIELDING TENT

Ryotaro Nohmura, Suita; Eiji Tazaki, Mitaka, and Akio Sato, Kodaira, all of Japan, assignors to Taiyo Kogyo Company Limited, Osaka, Japan

Filed May 6, 1976, Ser. No. 683,582
Claims priority, application Japan, Sept. 6, 1975, 50-108192
Int. Cl.[2] E06B *9/17*
U.S. Cl. 160—266 11 Claims



1. A foldable shielding tent for a window comprising in combination:

a. mounting means adapted to be secured to a structure adjacent the top of the window;

b. elongated winding means;

c. means releasably securing said winding means to said mounting means;

d. means biasing said winding means for rotation in one direction;

e. web material secured at one end thereof to said winding means for coiling about said winding means when rotated in said one direction;

f. a pair of elongated sliding frame members;

g. means pivotally securing one end of each of said sliding frame members to said mounting means adjacent opposite ends of said elongated winding means such that said sliding frame members extend in a generally downward direction;

h. means on at least one of said sliding frame members for retaining the free end of said web material at at least one location along the length of said sliding frame member;

i. a bottom member;

j. means pivotally securing one side of said bottom member to said sliding frame members adjacent their lower ends; such that said bottom member may be pivoted upwardly between the sliding frame members and the window; and

k. means for releasably securing the side of said bottom member opposite said one side to the structure adjacent the bottom of the window;

l. whereby, when said shielding tent is unfolded, said sliding frame members extend angularly outwardly from the top of the window when the lower ends of said sliding frame

members are supported by said bottom member at a predetermined distance from the bottom of said window, and when said shielding tent is folded, said sliding frame members extend parallel to the window when said bottom member is released from the structure and pivoted upwardly parallel to said sliding frame members; and

m. whereby different winding means supporting different web materials may be exchanged in said shielding tent.

4,060,120

INVESTMENT CASTING PROCESS OF CHROMIUM-COBALT AND/OR NICKEL ALLOYS

Shigeo Takahashi; Michio Ito, both of Shoziri; Sakae Nagasawa, Matsumoto, and Sigeo Suzuki, Nagoya, all of Japan, assignors to Matsumoto Dental College, Shiroziri and Sumitomo Chemical Company, Limited, Osaka, both of, Japan

Filed Dec. 31, 1975, Ser. No. 645,895
Int. Cl.² B22D *21/06, 13/00*
U.S. Cl. 164—35 **5 Claims**

1. In an investment casting process for producing dental restorations having excellent dimensional accuracy and excellent surface smoothness by the steps of fixing a wax pattern onto a truncated cone in a metallic ring having a lining of a cushioning material, pouring an investment material into the space around the wax pattern in the metallic ring, drying the resultant product, melting out the invested wax pattern, curing the resultant product to give a mold, fixing the mold to a centrifugal casting machine and casting a molten chromium-cobalt and/or nickel alloy in the mold, wherein the improvement comprises curing the mold by heating it at a temperature of 700° to 950° C for 20 to 150 minutes and centrifugally casting the alloy while maintaining the temperature of the mold at 100° to 500° C.

4,060,121

SPRUE REMOVAL MECHANISM FOR DIE CASTING APPARATUS

Robert E. Gwaltney, Brentwood, and John L. Mikovits, Nashville, both of Tenn., assignors to Bada Company, Inc., Elk Grove Village, Ill.

Filed July 6, 1976, Ser. No. 702,933
Int. Cl.² B22D *31/00*
U.S. Cl. 164—262 **9 Claims**

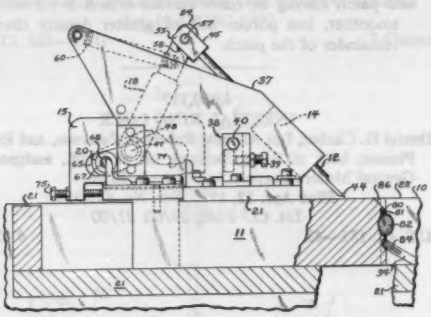
1. A die casting apparatus with a sprue removal mechanism including a supporting frame, a first die mounted on the frame having two transversely separable segments, a second die reciprocably mounted on the frame longitudinally movable into engagement with the first die, the dies having mating faces defining a mold cavity therebetween when in closed engagement, and an injection gate through which molding material is delivered to the mold cavity, the sprue removal mechanism comprising:

a rocker arm having oppositely disposed end portions, said rocker arm being pivotally mounted to the supporting frame intermediate said end portions to swing about an axis fixed relative to the supporting frame;

cam means fixed to the second die for movement therewith;

cam following means carried by one of said end portions of said rocker arm for operatively engaging said cam means; and

a degater knife mechanically connected to the other of said end portions of said rocker arm, said degater knife being adapted to sever a sprue from a casting whereby movement of the second die away from the first die causes said



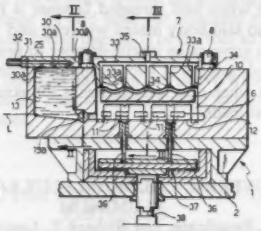
cam following means to travel along said cam means to pivot said rocker arm about said fixed axis and drive said knife from a retracted position spaced from the mold cavity to an extended position between the open first die segments to sever the sprue from the casting while the casting is supported by the first die segments.

4,060,122

LOW-PRESSURE DIE CASTING MACHINE

Gaetano Di Rosa, Pino Torinese (Turin), Italy, assignor to FATA S.p.A., Turin, Italy

Filed Jan. 31, 1977, Ser. No. 764,144
Claims priority, application Italy, Feb. 4, 1976, 67255/76
Int. Cl.² B22D *17/00*
U.S. Cl. 164—304 **5 Claims**



1. In a low pressure die casting machine for light alloy castings, of the type comprising:

a plurality of cooperating die elements which define between them a die cavity,

at least two of said die elements being separable by a relative horizontal movement,

means defining a charging chamber which is closable in a pressure-tight manner and which, in use of the machine, receives a charge of molten alloy to be cast in said die cavity,

casting conduit means connecting said charging chamber to said die cavity, said casting conduit means communicating at one end with the lower part of said charging chamber,

a plurality of casting gates interconnecting said die cavity and the other end of said casting conduit means, and

means for applying to the interior of said charging chamber, above the space occupied therein by a charge of molten alloy, a pressure above atmospheric pressure whereby to urge said charge of molten alloy along said casting con-

duit means and into said die cavity through said casting gates,

the improvement which consists in:

said charging chamber is formed by means defining cooperating recesses in two of said die elements and is located to one side of said die cavity,

means defining a removable cover which can close over said casting chamber in a pressure-tight manner,

the bottom of said charging chamber, said casting conduit and said casting gates are all located at a level corresponding substantially to that of the lower portion of said die cavity,

means defining recesses in facing surfaces of said two die elements defining said casting conduit and said casting gates, said recesses being so shaped that any alloy which solidifies in the said casting conduit, or said casting gates defined thereby does not impede the opening movement of said two die elements or the subsequent ejection of a casting made in the die constituted by said plurality of die elements, and

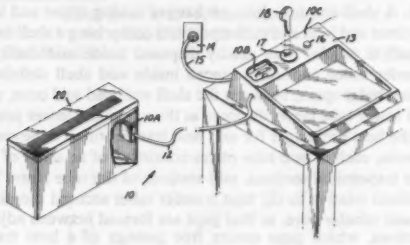
valve means in said die for selectively closing communication between said charging chamber and said casting conduit.

4,060,123

ENERGY SAVING TEMPERATURE CONTROL APPARATUS

Gerald F. Hoffman, Excelsior, Minn., and Dewayne P. Bolton, Memphis, Tenn., assignors to Fabri-Tek Incorporated, Minneapolis, Minn.

Filed Sept. 27, 1976, Ser. No. 726,977
Int. Cl.² G05D *23/24;* F05B *65/00*
U.S. Cl. 165—11 **10 Claims**



1. A method of conserving electrical energy in heating and cooling a room having an individual heating and cooling unit load normally energized from an electrical power source to maintain the ambient room air temperature within a selectable comfort temprature range, comprising the steps of:

a. sensing the ambient air temperature within a room and providing a variable electronic output signal responsive thereto;

b. electronically determining in response to said variable electronic output signal whether the sensed air temperature is within a predetermined energy saving range of consecutive temperature degrees and selectively providing an interrupt control signal in response thereto;

c. automatically electrically preventing in response to said interrupt control signal, energization of the heating and cooling unit load whenever said sensed ambient room air temperature is within said predetermined energy saving temperature range; and

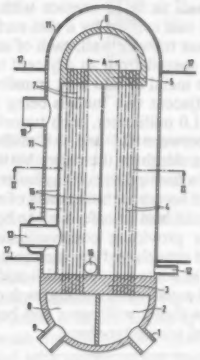
d. detecting the active presence of an occupant within the room by electrically sensing presence within the room of a uniquely detectable physical activating member of a type generally carried by the room occupant upon leaving the room, and overriding said energy prevention response to said interrupt control signal, to maintain the ambient air room temperature within the comfort temperature range, whenever the activating member presence is detected within the room.

4,060,124

FEEDWATER PREHEATER WITH TWO STEAM CHAMBERS

Herbert Tratz, Ottensoos; Fritz Kelp, and Erich Netsch, both of Erlangen, all of Germany, assignors to Kraftwerk Union Aktiengesellschaft, Mulheim (Ruhr), Germany

Filed Dec. 8, 1975, Ser. No. 638,456
Claims priority, application Germany, Dec. 10, 1974, 2458471
Int. Cl.² F22D *1/32*
U.S. Cl. 165—110 **4 Claims**



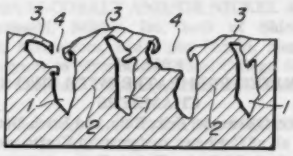
1. Feedwater preheater for heating feedwater in the form of steam turbine condensate by means of condensing extraction steam from a turbine, comprising a casing containing an outer steam chamber, a fixed tube plate and a movable tube plate disposed opposite one another in the casing, feedwater inlet and outlet chambers located adjacent said fixed tube plate, a feedwater reversing chamber disposed in said casing and partly defined by said movable tube plate, a first group of rectilinear feedwater conducting tubes connected at one end thereof through said fixed tube plate to said feedwater inlet chamber and at the other end through a first part of said movable tube plate to said reversing chamber, a second group of rectilinear tubes connected at one end thereof through a second part of said movable tube plate to said reversing chamber and at the other end thereof through said fixed tube plate to said feedwater outlet chamber, a steam vessel disposed in said casing and surrounding said second group of tubes, said steam vessel being closed against communication with said outer steam chamber and being rigidly connected to said second part, said first part of said movable tube plate extending freely beyond the connection of said steam vessel to said second part of said movable tube plate, said first group of tubes, on the one hand, and said second group of tubes, on the other hand, being substantially parallel to and coextensive with one another being mutually spaced apart a given distance so as to permit tipping and deformation of said movable tube plate within given limits in response to stresses producible therein by varying thermal expansion of the tubes of said first and second groups thereof.

4,060,125

HEAT TRANSFER WALL FOR BOILING LIQUIDS

Kunio Fujie, Tokyo; Wataru Nakayama; Heikichi Kuwahara, both of Kashiwa, and Kimio Kakizaki, Hitachi, all of Japan, assignors to Hitachi Cable, Ltd. and Hitachi, Ltd., both of, Japan

Filed June 16, 1975, Ser. No. 586,930
Claims priority, application Japan, Oct. 21, 1974, 49-120261
Int. Cl.[2] F28F *13/00*
U.S. Cl. 165—133 16 Claims



1. A heat transfer wall of thermally conductive metal for contacting a liquid and transferring heat to said liquid, comprising:

a multiplicity of tunnels formed beneath a surface of said heat transfer wall to be in contact with said liquid and separated from said surface by a thin surface layer of the metal of said heat transfer wall, each of said tunnels being parallel to and spaced from an adjacent tunnel through a thin wall of the metal of said heat transfer wall, the spacing between adjacent two tunnels being in the range between 0.2 and 1.0 millimeter, each tunnel having a width in the range between 0.1 and 0.8 millimeter and each tunnel having a depth in the range between 0.2 and 0.8 millimeter; and a multiplicity of tiny holes formed through said thin surface layer separating each of said tunnels from the surface of said heat transfer wall to be in contact with said liquid, for providing communication between the interiors of said tunnels and the surface of said heat transfer wall to be in contact with said liquid, said tiny holes being arranged equidistantly along each of said tunnels at intervals of less than 1 millimeter and being of a substantially equilateral triangular-shape.

4,060,126

HEAT TRANSFER BETWEEN SOLIDS AND FLUIDS UTILIZING POLYCRYSTALLINE METAL WHISKERS

Hermann J. Schladitz, 74 Plaentschweg, Munich, Germany

Continuation of Ser. No. 489,095, July 17, 1976, abandoned, which is a division of Ser. No. 308,433, Nov. 21, 1972, Pat. No. 3,824,247. This application Aug. 20, 1976, Ser. No. 716,096
Claims priority, application Germany, Nov. 22, 1971, 2157807
Int. Cl.[2] F28F *1/10*
U.S. Cl. 165—133 5 Claims

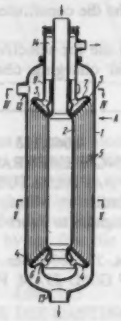
1. A heat transfer element having at least one surface cooperating in defining a path for conducting a fluid medium, and polycrystalline metal whiskers attached in a heat conducting manner to said surface to thereby increase the heat emitting and absorbing surface area of said element, said whiskers being formed of thin elongated members attached in substantial alignment with overlapping ends to further enhance the conductivity and the strength of the heat transfer element, said whiskers penetrating the boundary layer of the fluid as the fluid is conducted over said surface with the strength of the whiskers being capable of withstanding the pressure of the flowing medium.

4,060,127

SHELL-AND-TUBE HEAT EXCHANGER

Nikolai Ivanovich Savin, ulitsa Zvezdinka 3, kv. 71; Tamara Alexandrovna Ternikova, prospekt Kirova, 2, kv. 63; Vladimir Jurievich Filippov, ulitsa Piskunova, 32, kv. 14, and Vladimir Ivanovich Shiryaev, ulitsa Strazh Revoljutsii, 22, kv. 19, all of Gorky, U.S.S.R.

Filed Apr. 15, 1975, Ser. No. 568,184
Int. Cl.[2] F28F *9/02*
U.S. Cl. 165—145 1 Claim



1. A shell-and-tube heat exchanger having upper and lower portions and inlet and outlet portions comprising a shell having a wall; a tubular core axially disposed inside said shell; heat transfer tubes uniformly spaced inside said shell defining an intertubular space, between the shell wall and said core; upper and lower tube plates disposed at the upper and lower portions of the heat exchanger for said heat transfer tubes to be secured therein; each of said tube plates consisting of an array of separate trapezoidal sections, said sections of the tube plates being inclined relative to the heat transfer tubes secured therein and to said tubular core, so that gaps are formed between adjacent sections, which gaps ensure free passage of a heat transfer agent in the axial direction into the intertubular space at the inlet and outlet portions of the heat exchanger; inlet and outlet collectors connected to each section of the upper and lower tube plates, respectively, for the supply of the heat transfer agent into said heat transfer tubes.

4,060,128

TERTIARY CRUDE OIL RECOVERY PROCESS

William J. Wallace, 5815 Queenslock, Houston, Tex. 77096

Filed Oct. 1, 1976, Ser. No. 728,871
Int. Cl.[3] E21B *43/25*
U.S. Cl. 166—249 1 Claim

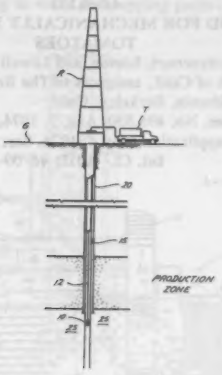
1. A method for secondary recovery of hydrocarbons from a well bore having a casing and hydrocarbon pump therein comprising the steps of:

a. Positioning a sonic source below the casing in the well bore and below the desired production zone;

b. Transmitting power to the sonic source to thereby cause said sonic source to emit sonic waves through the earth's strata to the desired production zone;

c. Changing the orifices among the earth's strata surrounding the hydrocarbons by using the sonic waves emitted from the sonic source to thus change the surface tension of the hydrocarbons in the production zone;

d. Producing the hydrocarbons with the hydrocarbon pump due to the hydrocarbons gravitating to the well bore because the reduction of surface tension of the hydrocarbons enables the hydrocarbons to fall downwardly toward the well bore and follow the return echo force vector wave emanating toward the sonic source.

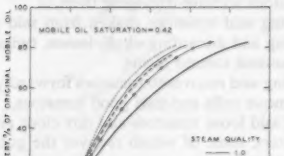


4,060,129

METHOD OF IMPROVING A STEAM DRIVE

Ezzat E. Gomaa, El Cerrito, and Roger E. Young, San Rafael, both of Calif., assignors to Chevron Research Company, San Francisco, Calif.

Filed Dec. 1, 1976, Ser. No. 746,565
Int. Cl.² E21B *43/24*
U.S. Cl. 166—252 **3 Claims**



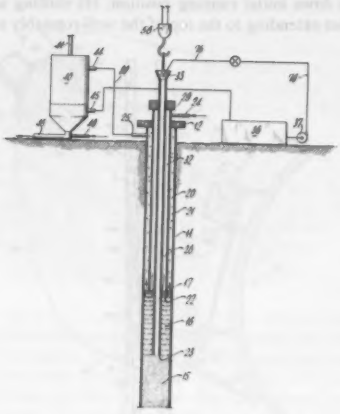
1. In a method of assisting the recovery of hydrocarbons from a hydrocarbon-bearing formation wherein high-quality steam has been injected through an injection well into a hydrocarbon-bearing formation to initiate a steam drive by promoting a flow of hydrocarbons to a production well for recovery therefrom, the improvement comprising determining the average quality of the steam that has been injected into the formation during the steam drive and then injecting steam having a predetermined low-quality or water in a predetermined quantity to adjust the cumulative quality of the total steam injected into the formation to a value of between 35% quality and 45% quality and then maintaining the quality of the steam injected into the formation within a range of from 35 to 45% to continue the steam drive.

4,060,130

CLEANOUT PROCEDURE FOR WELL WITH LOW BOTTOM HOLE PRESSURE

Joseph I. Hart, Pointe-a-Pierre, Trinidad and Tobago, assignor to Texaco Trinidad, Inc., Pointe-a-Pierre, Trinidad and Tobago

Filed June 28, 1976, Ser. No. 700,624
Int. Cl.² E21B *21/00, 43/25*
U.S. Cl. 166—312 **10 Claims**



1. Cleanout procedure for a low pressure well containing sand fill and well fluid therein, comprising the steps of:
inserting a first string of pipe in said well and forming an outer annulus therearound in the well,
said first string extending below the static fluid level of said well fluid in said well,
inserting a second string of pipe inside said first string and forming an inner annulus between said strings, said second string extending adjacent to the top of said sand fill,
applying a gas under pressure to one of said annuli, and
circulating a wash fluid down said second string of pipe to wash out sand with gas entrained fluid through the other of said annuli.

4,060,131

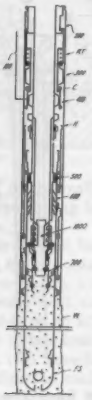
MECHANICALLY SET LINER HANGER AND RUNNING TOOL

John W. Kenneday; Charles W. Kinney; Floyd L. Scott, Jr., and Phillip W. Schmuck, all of Houston, Tex., assignors to Baker International Corporation, Houston, Tex.

Filed Jan. 10, 1977, Ser. No. 758,359
Int. Cl.² E21B *23/00, 43/10*
U.S. Cl. 166—315 **65 Claims**

63. A method of running, setting and anchoring a liner in a well bore casing, comprising the steps of: (1) inserting within said well bore an apparatus connectable to a tubular member extendible to the top of the well thereof, said apparatus comprising: an inner longitudinally extending body, an outer longitudinally extending body around said inner body; connecting means on one of said inner and outer bodies for connection of a liner therebelow; expander means carried on one of said inner and outer bodies; gripping means carried on the other of said inner and outer bodies and engagable with said expander means whereby said gripping means are shifted into gripping engagement with said casing; a manipulatable tubular running tool releasably secured to said inner and outer bodies, drag means mounted on said running tool slidable longitudinally along said casing; means for selective disengagement of said running tool from said inner and outer bodies, and setting means carried on said running tool and responsive to manipulation of said running tool to longitudinally shift one of said inner

and outer bodies with respect to the other of said inner and outer bodies to anchor said liner to said casing, said drag means resisting longitudinal travel of said apparatus while in said well bore with sufficient frictional force to support the weight of one of said inner and outer bodies therebelow and to afford operation of said setting means; (2) running said apparatus in said well to a positionable depth within said well bore adjacent said casing; (3) raising said tubular member extendible to the top of the well to remove said carriage means within said slot means from initial running position; (4) shifting said tubular member extending to the top of the well rotatably and longitudinally downwardly to cause said carriage means to travel in said slot means to position for anchoring said liner within said well bore and on said casing and for shifting said longitudinally shiftable tubular body downwardly with respect to said sleeve means to cause said expander means carried by said tubular body to engage said gripping means carried on said sleeve means and move said gripping means outwardly into gripping engagement with said well bore casing; and (5) rotating said tubular member extendible to the top of the well to release said tubular running tool from said longitudinally shiftable body for subsequent retrieval of said running tool out of said well bore.



4,060,132

FIRE FIGHTING WITH THIXOTROPIC FOAM

Peter J. Chiesa, Jr., Coatesville, Pa., assignor to Philadelphia Suburban Corporation, Bryn Mawr, Pa.

Continuation-in-part of Ser. No. 525,175, Nov. 19, 1974, Ser. No. 369,584, June 13, 1973, Pat. No. 3,957,657, and Ser. No. 307, 479, Nov. 17, 1972, abandoned, said Ser. No. 525,175 is a continuation-in-part of said Ser. No. 369,584, said Ser. No. 307, 479, and Ser. No. 254,404, May 18, 1972, Pat. No. 3,849,315, said Ser. No. 369,584 is a continuation-in-part of said Ser. No. 307,479, said Ser. No. 254,404 and Ser. No. 131,763, Apr. 6, 1971, abandoned, said Ser. No. 307,479, is a continuation-in-part of said Ser. No. 254,404 and said Ser. No. 131,763, said Ser. No. 254,404 is a continuation in-part of said Ser. No. 131,763. This application Mar. 12, 1975, Ser. No. 557,757.

Int. Cl.[2] A62D *1/00*

U.S. Cl. 169—47 **4 Claims**

1. In the method of fighting a fire on a burning liquid with a single fire-fighting concentrate by highly diluting the concentrate with water, foaming the diluate, and applying the foamed diluate to the burning liquid to blanket and thus extinguish the burning, the improvement according to which the burning liquid is a hydrophilic liquid and the concentrate contains a dissolved thixotropic polysaccharide in an amount that causes the foamed diluate to gel upon contact with the hydrophilic liquid and lose some of its water to the hydrophilic liquid to form a foamed mat that does not dissolve in the hydrophilic liquid rapidly enough to significantly diminish the blanketing action of the foam.

4,060,133

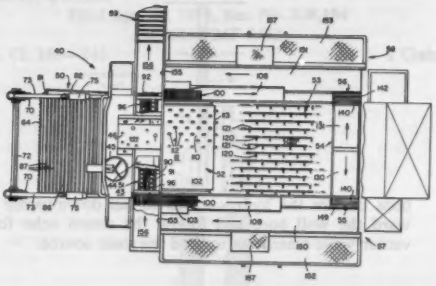
METHOD FOR MECHANICALLY HARVESTING TOMATOES

Thomas S. Bettencourt, Isleton, and Lowell K. Marshall, Sacramento, both of Calif., assignors to The Regents of the University of California, Berkeley, Calif.

Division of Ser. No. 495,530, Aug. 7, 1974, Pat. No. 3,986,561. This application May 4, 1976, Ser. No. 683,066

Int. Cl.[2] A01D *46/00*

U.S. Cl. 171—1 **5 Claims**



1. A method of mechanically harvesting tomatoes comprising the steps of:

a. moving a mechanical harvester through a row of growing tomato plants,

b. slicing a thin top layer of soil in said row to sever tomato plant stems just below the surface of the ground,

c. picking up severed tomato plants, loose tomatoes, and dirt clods, while returning the loose dirt to the ground,

d. separating said severed tomato plants from said loose tomatoes and dirt clods,

e. agitating said tomato plants with an increasingly intense up and down and forward and backward motion to shake off tomatoes without damaging them,

f. recovering said tomatoes shaken from said plants while separating and discarding chaff, leaves, twigs, dirt, trash, and exhausted tomato plants,

g. conveying said recovered tomatoes forwardly past sorters who remove culls and pass good tomatoes,

h. passing said loose tomatoes and dirt clods rearwardly by said sorters, some of whom recover the good said loose tomatoes, and

i. loading said recovered good tomatoes into a suitable container.

4,060,134

SOIL CULTIVATING IMPLEMENTS

Cornelis van der Lely, 7, Bruschenrain, Zug, Switzerland

Filed Apr. 6, 1976, Ser. No. 674,166

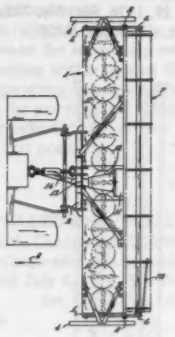
Claims priority, application Netherlands, Apr. 11, 1975, 7504320

Int. Cl.[2] A01B *33/14*

U.S. Cl. 172—59 **8 Claims**

1. A soil cultivating implement comprising a frame and a plurality of adjacent soil working members rotatably supported on said frame, said members being rotatable about corresponding upwardly extending axes and driving means engaging said members to rotate same and work soil, each of said members comprising a support and at least one downwardly extending substantially rigid tine fastened to said support, said tine having an upper fastening portion and a lower soil working portion, said fastening portion being held in a holder adjacent an outer end of said support, further soil working tine means deflectively mounted on said soil working mem-

ber and rotatable therewith, said further tine means being fastened to said holder by at least one spring coil that surrounds said holder, the tine means of adjacent soil working members cooperating to work overlapping paths of soil during



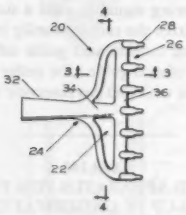
operation, and said tine means being deflectable against the resilient opposition of said coil and turnable about an axis that is substantially parallel to the axis of rotation of the corresponding soil working member.

4,060,135

SHEET METAL GARDEN TOOL

William A. Keller, Crestwood, Mo., assignor to Keller Manufacturing Co., Inc., St. Louis, Mo.

Filed Aug. 2, 1976, Ser. No. 711,094
Int. Cl.² A01B 1/14
U.S. Cl. 172—380 8 Claims



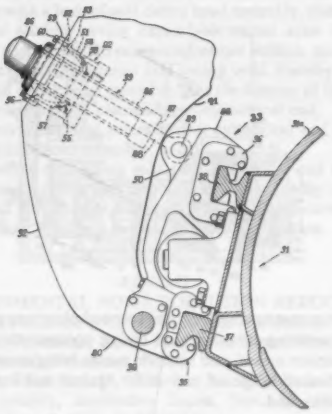
1. A sheet metal garden tool comprised of a flat body bounded on its edges by a forwad head portion, a rearward central handle receiving portion, and opposed side portions each bounded by a generally perpendicular bent over flange, said side portions curving rearwardly from said forward head portion to said handle receiving portion, said head portion having a plurality of forward extending tines, said tines having spaced apart side walls of substantially uniform depth defining a generally inverted U-shaped cross section at the rear thereof and merging with a flange portion of said head, said flange portion extending at right angles to the tines and having sections thereof connected at opposed ends to said tine side walls, the outer tines having outer downwardly extending side walls formed in the same plane as the bent over flanges of the body and formed so that each of said outer side walls forms a continuous planar surface with one of said flanges, said flanges extending from said outer side walls of said tines as a continuous border of the body rearwardly to and merging with the handle receiving portion and said tine side walls being pressed solidly together at a forward terminating end portion, said latter portion extending a substantial length of the tine to provide strength and rigidity.

4,060,136

MOTOR GRADER BLADE MOUNTING AND TILT MECHANISM

Vergil Philip Hendrickson, Morton, and Carroll Richard Cole, Decatur, both of Ill., assignors to Caterpillar Tractor Co., Peoria, Ill.

Filed June 14, 1976, Ser. No. 696,106
Int. Cl.² E02F 3/76
U.S. Cl. 172—795 5 Claims



1. In a motor grader which has a circle, improved grader blade mounting means comprising, in combination:

a pair of integral, depending support arms at the rear of the circle;

blade carrying means including a pair of bearing housings the lower end portions of which are mounted on transverse pivots in the lower extremities of the support arms, said bearing housings having an upright position forward of said arms and having upper portions which are located laterally inwardly from and immediately adjacent the arms;

jaw means at the front of said blade carrying means adapted to mount a grader blade assembly for lateral shifting movement;

integral sleeves at the upper parts of the arms, said sleeves having one side defined by the arms and having longitudinal axes aligned with extreme upper portions of the bearing housings, extensions of said axes lying substantially tangential to an arc of a circle struck about the transverse pivots which mount the bearing housings;

and a hydraulic cylinder and piston unit supported in each of said sleeves, each of said units having a head end at the rear of the sleeve and a piston rod lying on the projected axis of the sleeve and connected to a transverse pivot on said upper portion of the adjacent bearing housing, whereby working forces are applied substantially axially to said piston rods in all positions of the housings.

4,060,137

TORQUE WRENCH

John H. Bickford, Middletown; Donald H. Ranheim, Jr., East Hartford, and Willard A. Saxby, Newington, all of Conn., assignors to Raymond Engineering Inc., Middletown, Conn.

Filed May 3, 1976, Ser. No. 682,735
Int. Cl.² B25B 23/145
U.S. Cl. 173—12 29 Claims

1. A torque wrench including:

a casing;

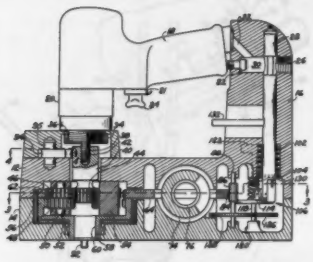
input drive .eans in said casing receiving an operating input;

first planetary gear means in said casing drivingly connected to said input drive means;

rotatable output means connected to and driven by said first planetary gear means, said output means being adapted to engage an element to be torqued;

second planetary gear means in said casing drivingly connected to said input drive means;

said first and second planetary gear means having different gear ratios and common sun gear means;



reaction means coupled to said second planetary gear means;

load resisting means in said casing coooperating with said reaction means, said reaction means being movable within a limited range of movement against said load resisting means; and

indicating means operatively connected to said reaction means to indicate the torque output of the wrench as a function of the movement of said reaction means.

4,060,138

VIBRATORY TOOLS

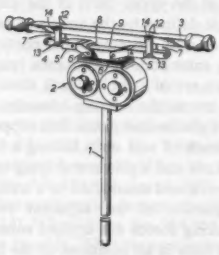
William Edward Cox, Great Missenden, and Frank James Lee, Okehampton, both of England, assignors to Post Office, London, England

Filed July 8, 1976, Ser. No. 703,665

Claims priority, application United Kingdom, July 11, 1975, 29244

Int. Cl.² H01B *17/00*

U.S. Cl. 173—49 **11 Claims**



1. A vibratory tool having a handle, a body and a vibration isolation mechanism connecting the handle to the body, the vibration isolation mechanism comprising two beams pivotally connected to the tool body and, for each beam, at least one respective torsionally-resilient member, the torsionally-resilient members being so mounted relative to the beams as to convert translational oscillation of the tool body into forced angular oscillation of each beam about a respective induced nodal axis located perpendicular to the beam and at a position along the length thereof, and means pivotally connecting the handle to each beam at the said nodal axis, which means offers substantially no resistance to rotational movement of the beam in a plane to which the nodal axis is perpendicular.

4,060,139

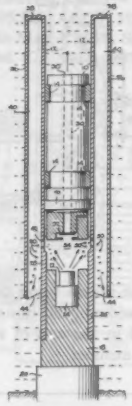
UNDERWATER GAS DISCHARGE HAMMER WITH GAS RESERVOIR

Harold Lee Adair, Rockwall, Tex., assignor to Raymond International Inc., Houston, Tex.

Filed Nov. 29, 1976, Ser. No. 745,637

Int. Cl.² B25D *9/00*

U.S. Cl. 173—137 **13 Claims**



1. A gas discharge type underwater hammer comprising, a hollow elongated guide tube open at its upper end, a massive ram guided for up and down movement inside said guide tube, an anvil mounted at the lower end of the guide tube in the path of movement of said ram to be struck by said ram on its downward stroke, means forming a cavity within said guide tube under and open to said ram, a gas discharge device positioned within said cavity, said gas discharge device being operable in response to a triggering signal to emit a sudden discharge of pressurized gas to drive the ram upwardly in the guide tube, a gas reservoir located outside said guide tube, and means for placing the interior of said guide tube under the ram into open fluid communication with said gas reservoir during the upward stroke of said ram.

4,060,140

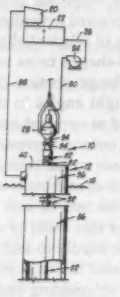
METHOD AND APPARATUS FOR PREVENTING DEBRIS BUILD-UP IN UNDERWATER OIL WELLS

Burchus Q. Barrington, Duncan, Okla., assignor to Halliburton Company, Duncan, Okla.

Continuation-in-part of Ser. No. 624,950, Oct. 22, 1975, abandoned. This application Oct. 12, 1976, Ser. No. 731,251

Int. Cl.² E21B *15/02*

U.S. Cl. 175—7 **29 Claims**



1. A drilling tool, for use with a drill string insertable within

a riser pipe string in underwater drilling operations, comprising:

a first tubular member having an upper end portion, a lower end portion and an inner diameter greater than the outer diameter of at least a part of the drill string by less than a predetermined amount;

support means adjacent said lower end portion of said first tubular member for supporting said first tubular member at a first position within at least the lower end portion of said riser pipe string independently of said drill string; and

carrier means for carrying said tubular member on said drill string independently of said riser pipe string at positions above said first position.

4,060,141

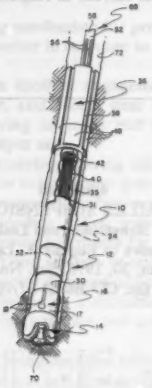
SELF-PROPELLED DEEP WELL TURBINE DRILL

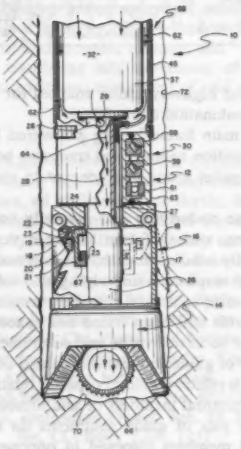
Fritz C. Catterfeld, Canoga Park, Calif., assignor to Rockwell International Corporation, El Segundo, Calif.

Filed July 6, 1976, Ser. No. 703,042

Int. Cl.² E21B *1/06*

U.S. Cl. 175—94 **8 Claims**





1. A self-propelled turbine drill apparatus for drilling well holes comprising:

means clamping a first cylindrical end against a well casing wall, said first cylindrical end making up part of said turbine drill having clamping means therein, said first end being operably connected to and opposite to a second cylindrical end containing a cutter head assembly, said first and second ends being axially movable one from the other,

means driving said cutter head assembly at said second end deeper into said well hole by extending said cutter head assembly axially from said clamped first cylindrical end,

means clamping said cutter head assembly at said second cylindrical end near the end of said well hole when said cutter head assembly is advanced axially into said hole its maximum length, said means clamping said cutter head assembly is an underreamer section affixed to and axially in line with a base of said cutter head assembly, said underreamer section having expandable cutter arms equidistantly spaced around said underreamer section, said cutter arms expand out against said casing wall, thereby clamping said cutter head assembly near the bottom of the hold,

means releasing said clamped first cylindrical end,

means retracting said released first cylindrical end toward said cutter head assembly, and

subsequently reclamping said first cylindrical end thereby initiating a subsequent turbine drill cycle thereby advancing said drill deeper into said hole after said cutter arms have been retracted in said underreamer section.

4,060,142

ENVIRONMENTAL NOISE POLLUTION REDUCTION DEVICE OF RUNNING ROAD VEHICLE

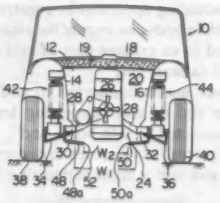
Eiichi Abe, Yokohama, Japan, assignor to Nissan Motor Company, Limited, Yokohama, Japan

Filed Nov. 19, 1975, Ser. No. 633,419

Claims priority, application Japan, Nov. 20, 1974, 49-139551[U]; June 5, 1975, 50-76601[U]

Int. Cl.² B62D *25/08*

U.S. Cl. 180—54 A **8 Claims**



1. In a road vehicle body including an engine compartment in which an engine is disposed, the engine compartment being defined by two opposite longitudinal side panels, a hood spanning between the top portions of the side panels, a fire-wall separating a passenger compartment from the engine compartment, and a front wall oppositely disposed to the fire-wall and having therethrough openings for inducting cooling air, the engine compartment having at its bottom portion a generally rectangular opening in plan, the improvement comprising:

first and second under-covers which are of generally elongate rectangular shape in plan and generally of the same size for partly covering the rectangular opening to reflect the engine noise, said first and second under-covers being oppositely disposed longitudinally along the bottom portions of the side panels and extending from the front wall to the fire-wall, the opposed edges of said first and second under-covers being separated from each other by a rectangular ventilation opening therebetween, the bottom portion of the engine being substantially spaced apart from the plane of the rectangular ventilation opening and substantially closer to the hood than the plane of the rectangular ventilation opening, said first and second under-covers being respectively secured to two opposite rigid side members which extend from the front wall toward the fire-wall and are attached to the bottom portions of the side panels, the engine being mounted on the side members, the width of said rectangular ventilation opening

defined between the opposed edges of the under-covers being in the range of 60 to 75% of the width of said rectangular opening defined between the opposed inner sides of the side members; and

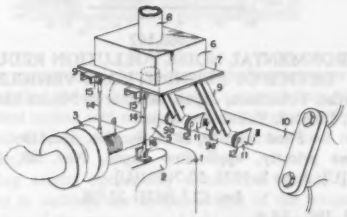
sound absorbent material attached to the inner surface of the hood for absorbing the noise reflected by the under-covers into the engine compartment.

4,060,143

MUFFLER MOUNTING APPARATUS IN CONSTRUCTION MACHINERY

Takeshi Matsumoto, Hirakata; Kazukiyo Chiba, Katano; Atsuo Shioyama, and Yoshitake Yamaguchi, both of Hirakata, all of Japan, assignors to Kabushiki Kaisha Komatsu Seisakusho, Tokyo, Japan

Filed Feb. 5, 1976, Ser. No. 655,577
Claims priority, application Japan, Feb. 5, 1975, 50-015911[U]
Int. Cl.² B60K *13/04*
U.S. Cl. 180—64 A **9 Claims**



1. A muffler mounting apparatus in construction machinery comprising a vehicle body, an engine mounted on said body, a muffler connected to an exhaust port of said engine to reduce the noise level of exhaust gas,

supporting lever means connected to and supporting said muffler, one end of said supporting lever means being pivotally connected to said body, and

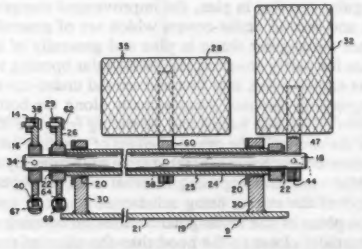
linkage means pivotally connected to and extending between said engine and said muffler supporting lever means.

4,060,144

COMBINED ACCELERATOR AND BRAKE ASSEMBLY

John J. Teti, Saltville, Va., assignor to Pyott-Boone Machinery Corporation, Saltville, Va.

Filed Jan. 12, 1976, Ser. No. 648,054
Int. Cl.² B60K *26/02*
U.S. Cl. 180—77 R **6 Claims**



1. An accelerator and brake pedal assembly for use on a vehicle having a floor, accelerator actuating means and brake actuating means, said pedal assembly comprising:

a mounting plate adapted to be mounted on the upper side of said floor;

a pair of spaced, upwardly extending supports mounted on said plate;

a bearing mounted in each of said supports, said bearings being aligned to define an axis;

a shaft extending along said axis, rotatably supported by said bearings;

an accelerator pedal mounted on said shaft for rotating therewith;

means mounted on said shaft for rotation therewith, adapted to be connected to said accelerator actuating means for control thereof in response to rotation of said accelerator pedal;

a tubular sleeve member coaxially, rotatably mounted on said shaft;

a brake pedal;

means for slidably mounting said brake pedal along said sleeve member between a plurality of fixed positions in which said pedal is rotatable with said sleeve member; and,

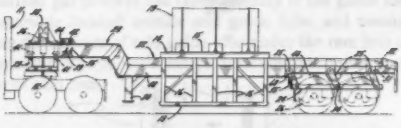
means mounted on said sleeve member for rotation therewith, adapted to be connected to said brake actuating means for control thereof in response to rotation of said brake pedal.

4,060,145

LIFT BED TRAILER SUSPENSION SUBFRAME

Stephen A. Kingman, Rensselaer, and Leslie A. Weaver, Monon, both of Ind., assignors to Eugene A. LeBoeuf, Gary, Ind.

Filed Jan. 20, 1976, Ser. No. 650,787
Int. Cl.² B62D *21/02*
U.S. Cl. 280—106 T **9 Claims**



5. In a lift bed highway trailer adapted for attachment to a tractor, the combination comprising:

a. a liftable main frame having a lowered loading and unloading position and a raised transport position;

b. a loaded pallet frame unit adapted to straddle said main frame;

c. a subframe underlying and pivotally connected to said main frame, said subframe having a vertical dimension substantially smaller than that of said main frame;

d. a wheeled suspension underlying said subframe;

e. a pair of main structural members secured in underlying relation with said main frame and spaced laterally from each other so as to overlie said subframe;

f. a first pair of guide abutments mounted on one end of said subframe is relatively closely spaced relation to said longitudinal structural members of said liftable main frame;

g. a second pair of guide abutments on said main frame structural members disposed in opposed and relatively closely spaced relation with said suspension guide abutments when said main frame is in raised transport position; and

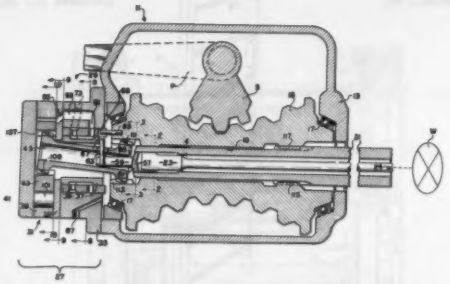
h. power lift means interposed at an acute angle between said main frame and said subframe for moving said main frame relative to said subframe between the lowered loading and unloading position and the raised transport position.

4,060,146

POWER STEERING MECHANISM

Edward J. Goscenski, Jr., Battle Creek, Mich., assignor to Eaton Corporation, Cleveland, Ohio

Filed Nov. 13, 1975, Ser. No. 631,754
Int. Cl.[2] F15B *13/16*
U.S. Cl. 180—161 21 Claims



1. A power steering mechanism for providing movement of an output steering member in response to rotation of a steering wheel, comprising:

a. a worm gear in toothed engagement with the output steering member, said worm gear being mounted in a housing and having an input end toward the steering wheel and an output end;

b. an input shaft receiving steering input and having a lost motion connection to said worm gear permitting a relative rotational displacement therebetween;

c. valve means including a first valve member rotatable relative to the housing and means for transmitting rotation of said input shaft into rotation of said first valve member;

d. a fluid-actuated motor disposed adjacent the output end of said worm gear including a movable element, said movable element having a motion one component of which is rotational;

e. said valve means being disposed between said output each of said worm gear and said fluid-actuated motor and being operable to direct pressurized fluid from a fluid source to said fluid-actuated motor upon said relative rotation of said first valve member, said pressurized fluid causing movement of said movable element; and

f. means for translating said movement of said movable element into rotational movement of said worm gear.

4,060,147

VEHICLES RIDING ON AIR CUSHIONS

Paul Guienne, Neuilly sur Seine; Guy Herrouin, Paris; Andre Lafont, Coudoux, all of France; Jean Bertin, deceased, late of Neuilly sur Seine, France; by Michel Bertin, Neuilly sur Seine, France; by Laurent Bertin, Neuilly sur Seine, France; by Philippe Bertin, Neuilly sur Seine, France; by Catherine Midy nee Bertin, Neuilly sur Seine, France; by Francoise Gonzalez-Camino nee Bertin, Madrid, Spain, and by Genevieve Bertin nee Loustau, heirs, Neuilly sur Seine, France, assignors to Bertin & Cie, Plaisir and Societe d'Etudes et de Developpement des Aeroglisseurs Marins, Terrestres et Amphibies S.E.D.A.M., Paris, both of, France

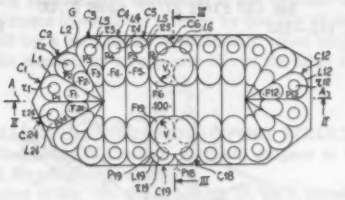
Filed Feb. 11, 1976, Ser. No. 657,120
Claims priority, application France, Feb. 18, 1975, 75.04960
Int. Cl.[2] B60V *1/04, 1/11*
U.S. Cl. 180—121 9 Claims

1. An air cushion vehicle comprising:

a platform,

a central air cushion region beneath said platform surrounded by a continuous series of peripheral cells, each of said cells including

an outer lobe and a tubular skirt within said lobe, a portion of each skirt and lobe defining a peripheral sector within each lobe, each skirt having a closed horizontal cross-section and being contiguous with the skirts immediately preceding and succeeding it to define a continuous ring of skirts, said ring of skirts being between said central air



cushion region and said peripheral sectors within said lobes, and

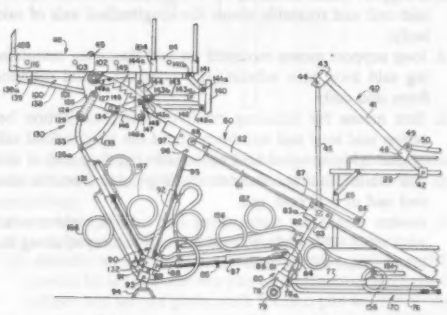
means carried by said platform for providing air under pressure to said central air cushion region, said ring of skirts, and said peripheral sectors within said lobes.

4,060,148

PORTABLE COLLAPSIBLE SCAFFOLD STRUCTURE

James T. Sidney, 1105 Wentworth Ave., Chicago Heights, Ill. 60411

Filed Dec. 23, 1976, Ser. No. 753,928
Int. Cl.[2] B66F *11/04*
U.S. Cl. 182—2 20 Claims



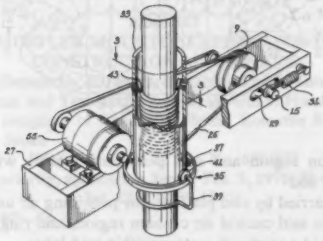
1. A portable collapsible scaffold structure adapted to be supported in use and transported by a self-powered ground vehicle, said scaffold structure comprising extensible support means adapted to be mounted on the associated vehicle, two spaced-apart parallel extensible boom members releasably attachable to said support structure for support thereby in an inclined use configuration with the upper ends thereof being spaced a substantial distance horizontally away from the vehicle, drive means coupled to said extensible support means for effecting extension and retraction thereof to change the angle of inclination of said boom members with respect to the ground, a work platform extending in use between said boom members and removably pivotally secured thereto adjacent to the upper ends thereof, and control means coupled to said boom members and to said platform and operative when the angle of inclination of said boom members changes to effect a corresponding change in the angle between said boom members and said platform for maintaining said platform substantially horizontal, said support means and said boom members and said platform and said drive means and said control means all being dimensioned so that when disassembled from one another they may be readily stored on the associated vehicle for transportation thereby.

4,060,149

CONVEYER APPARATUS

James C. Henley, 7240 S. 7th St., Space C-38, Phoenix, Ariz. 85011

Filed Nov. 17, 1976, Ser. No. 742,589
Int. Cl.² F16H 27/02; A63B 27/00
U.S. Cl. 182—133 10 Claims



1. A conveyer apparatus for producing translation along the longitudinal axis of a cylindrically shaped body, said apparatus comprising in combination:

a. a body having a substantially circular cross-section and a longitudinal axis;

b. an endless length of cable forming a coil around and in contact with said body, said coil having a first and a second end and said cable including a loop displaced from said body;

c. a support frame mounted on the first and second ends of said coil and rotatable about the longitudinal axis of said body;

d. loop support means mounted on said frame for maintaining said loop at a substantially constant radial distance from said coil;

e. first means for inducing relative rotational motion between said loop and said body about the longitudinal axis of said body to wind said cable onto the first end of said coil while simultaneously unwinding cable from the second end of said coil; and

f. tension means for maintaining said coil in tight contact with said body; whereby said frame is conveyed along the longitudinal axis of said body.

4,060,150

LADDER KIT

Peter Hughes, 33 Lower Park, Putney, SW. 15, London, England

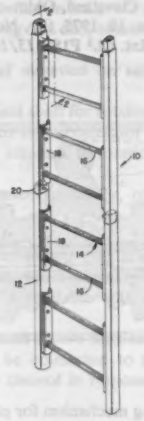
Continuation-in-part of Ser. No. 503,623, Sept. 6, 1974, abandoned. This application July 19, 1976, Ser. No. 706,621
Claims priority, application United Kingdom, Sept. 7, 1973, 42189/73
Int. Cl.² E06C 7/08, 1/08
U.S. Cl. 182—151 10 Claims

1. In a ladder comprising a plurality of interfitting parts which are adapted to be readily disassembled;

a plurality of elongated tubular elements,

at least one frame member, said frame member fastening by means of threaded fastening elements said tubular elements into a parallel pair of side rails of said ladder,

said frame member comprising a pair of rung holder brackets having a surface edge which abuts said side rail, wherein said fastening elements pass through said brackets and into said side rails, and wherein said rungs are fixed in said



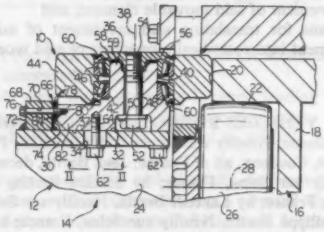
brackets and are received by second apertures in said side rails.

4,060,151

ADJUSTABLE ARBOR WHEEL MOUNTING ARRANGEMENT

Charles R. Chelin, and Alan J. Hickman, both of Peoria, Ill., assignors to Towmotor Corporation, Mentor, Ohio

Filed Dec. 20, 1976, Ser. No. 752,707
Int. Cl.² B66B 7/02
U.S. Cl. 187—95 5 Claims



1. An adjustable arbor wheel mounting arrangement, comprising:

a support frame having a mounting surface;

an arbor having an axis, an end mounting surface positioned substantially normal to the axis, and a reaction face;

wheel means mounted on the arbor for rotation about the axis;

fastening means for axially clamping the arbor end mounting surface against the mounting surface of the support frame at a preselected working position of the wheel means; and

abutment reaction means including an abutment bar having a reaction face and being mounted on the mounting surface of the support frame for directing thrust forces substantially normal to the axis from the wheel means and the reaction face of the arbor to the support frame.

4,060,152

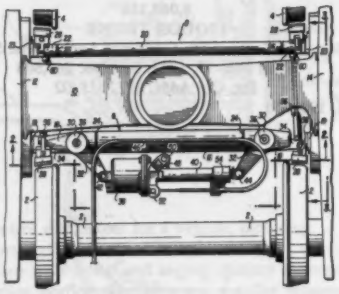
RAIL CAR BRAKE APPARATUS

Thomas M. Bogenschutz, Clayton; Thomas H. Engle, Cape Vincent, and Eugene D. McEathron, Watertown, all of N.Y., assignors to General Signal Corporation, Rochester, N.Y.

Continuation of Ser. No. 590,168, June 25, 1975. This application Apr. 28, 1976, Ser. No. 680,952

Int. Cl.² B61H *13/24*

U.S. Cl. 188—52 29 Claims



18. A brake rigging for a four-wheel type of vehicle truck, said rigging comprising:

a first brake beam extending transverse to the axis of said truck;

a second brake beam parallel to said first brake beam;

a pair of bell-crank levers each having a fulcrum and a pair of arms, said levers being pivotably mounted on said first brake beam at spaced locations thereon;

a pair of push rods, each one of the pair pivotably connected respectively at one end to one arm of said bell-crank levers and at the other end of said second brake beam; and

a fluid pressure operable brake actuator mounted between the other arms of said bell-crank levers for applying brake actuating forces in opposite directions to said levers, said actuator including means attached to said actuator for manually expanding said actuator to apply brake actuating forces in opposite direction to said levers in the event of a loss in fluid pressure.

4,060,153

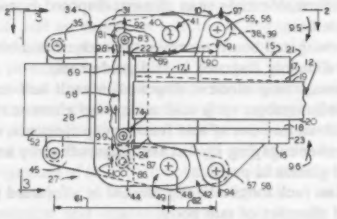
SELF-BALANCING BRAKE SHOES FOR CALIPER BRAKE

Jacob Kobelt, 6110 Oak Street, Vancouver, British Columbia, Canada (V6M 2W2)

Filed Sept. 14, 1976, Ser. No. 723,140

Int. Cl.² F16D *55/26*

U.S. Cl. 188—72.6 10 Claims



1. In a caliper brake assembly having a frame journalling on opposite sides thereof opposed first and second arms for rotation relative to the frame, the arms journalling first and second brake shoes respectively and cooperating with a brake actuator, a member to be braked being positioned between the shoes, a self-balancing means to equalize essentially wear of brake linings being characterized by:

a. a pair of balancing links, each link hingedly interconnecting a particular shoe on one side of the frame with an arm on the opposite side of the frame,

so that each shoe reflects movement of the opposite arm, so that a movement towards the member by one side of one shoe is reflected by a movement of essentially equal magnitude towards the member by an opposite side of the other shoe.

4,060,154

DISC BRAKES CALIPER AND SUPPORT STRUCTURE

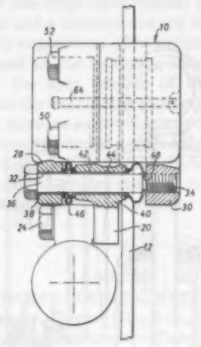
George Windsor Smith, Studley, England, assignor to Girling Limited, Birmingham, England

Continuation of Ser. No. 607,021, Aug. 22, 1975, abandoned. This application Feb. 25, 1977, Ser. No. 772,292

Claims priority, application United Kingdom, Aug. 28, 1974, 37517/74

Int. Cl.² F16D *55/224*

U.S. Cl. 188—73.3 11 Claims



1. A sliding caliper brake device for operatively cooperating with a brake disc which is rotatable abouts its central axis, comprising:

i. a torque plate;

ii. a caliper slidably connected to the torque plate;

iii. directly and indirectly operated friction pad assemblies carried by at least one of a pair of members comprising the caliper and torque plate, each friction pad assembly comprising a friction pad carried by a pad backing plate;

iv. a pair of drag taking abutments positioned to prevent lateral displacement of the friction pad assemblies in response to drag forces generated upon engagement of the pads with the brake disc when the disc is rotating;

v. a single guide pin mounting the caliper for axial sliding movement relative to the torque plate, said guide pin being:

a. of cylindrical section;

b. firmly fixed to one of said pair of members comprising the torque plate and the caliper;

c. a snug fit in a cylindrical hole in the other of said two members;

d. not directly contacted by either of said pad backing plates;

e. adapted such that relative sliding between said caliper and torque plate is effected by relative sliding between said guide pin and said hole, and

vi. at least one pad retention pin which:

f. extends through and operatively engages aligned apertures in the caliper, the torque plate and at least one of said pad backing plates such as firstly to directly prevent any movement of the pad carried by said at least one backing plate relative to the caliper and torque plate, in any mode in a plane perpendicular to said

central axis of the brake disc, which is not prevented by said drag taking abutments and secondly to directly prevent pivoting of the caliper about said guide pin relative to the torque plate;

g. is axially located with respect to one of said pair of members by a locking means;

h. is axially withdrawable upon release of the locking means to facilitate the removal of said pad assemblies to be removed without breaking the sliding connection between the caliper and torque plate; and

i. is unprotected by boots and sealing means at any aperture through which it passes.

4,060,155

HYDRAULIC SHOCK ABSORBER

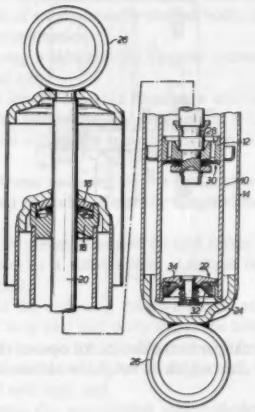
William Arthur Duckett, Ossett, England, assignor to Jonas Woodhead Limited, England

Filed Oct. 20, 1975, Ser. No. 623,989

Claims priority, application United Kingdom, Oct. 23, 1974, 45779/74

Int. Cl.² F16F 9/50

U.S. Cl. 188—282 **3 Claims**



1. In a hydraulic shock absorber comprising, a piston slideable in a cylinder and having an annular valve seat on one side and having at least one flow passage providing communication between the area within the said annular valve seat and the other side of the said piston, a first valve disc of resilient sheet material which is arranged to cooperate with the said annular valve seat to control flow through the said flow passage to said one side of the said piston from the other side of the said piston, and which has flow apertures extending therethrough, and a second valve disc of resilient sheet material which is positioned between a portion of the said piston and the said first valve disc and is arranged to cooperate with the surface of the first valve disc around said flow apertures to control flow from said one side of the said piston through the said flow apertures and the said flow passage to the other side of the said piston, the improvement comprising: forming the said flow apertures in said first valve disc each in the shape of an elongate arcuate slot whose center of curvature lies generally at the center of the first valve disc, with said flow apertures together subtending approximately 360° at the center of said first valve disc, whereby fluid flow through said flow apertures will flow radially outwardly between said first and second valve discs around substantially the whole circumference of said valve discs, said shock absorber further including a third valve disc of resilient sheet material supporting said first valve disc on the side thereof opposite to the side facing said valve seat, the third valve disc having flow apertures to accommodate fluid flow from said one side of said piston to said other side thereof, and said flow apertures of said first and third valve discs being so arranged that the total effective cross-sectional area of the flow path through said flow apertures is substantially independent of the relative angular position of said first and third valve discs.

4,060,156

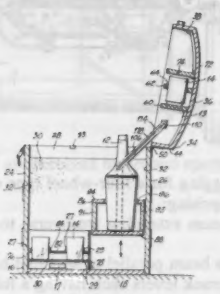
LIQUOR TRUNK

Gary Gast, 515 Janssen St., Combined Locks, Wis. 54113

Filed Feb. 17, 1977, Ser. No. 769,504

Int. Cl.² A45C 5/12, 13/02

U.S. Cl. 190—30 **9 Claims**



1. A liquor trunk for storage of glasses and liquor bottles, which comprises:

a. a body having a base, a pair of upwardly extending end walls, an upwardly extending front wall, an upwardly extending rear wall, an open top, and a chamber therein;

b. a cover member having a top; a pair of downwardly extending end walls, a downwardly extending rear wall, a downwardly extending front wall, an open base, and a chamber therein;

c. a plurality of hinge elements hingeably joining said rear wall of said body to said rear wall of said cover member;

d. a first elongated board element longitudinally disposed in said chamber of said cover member;

e. a second elongated board element longitudinally disposed in said chamber of said cover member above said first board element, said second board element having a plurality of openings therethrough, said glasses received through said opening to rest on said board element;

f. a pair of channel guide bars, one of said guide bars disposed on an inner surface of each said end wall of said cover above said second board element;

g. a deformable male snap element disposed in each of said guide bars;

h. an elongated board member, the ends of said board member slideably disposed in said guide bars;

i. a female snap element disposed in each said end of said board member, each said male snap element removably received into one of said female snap elements, said board member engaging against said glasses thereby maintaining said glasses in position;

j. a glass rack longitudinally aligned in a forward portion of said chamber of said body;

k. a bottle rack longitudinally aligned in said chamber rearwardly of said glass rack; and

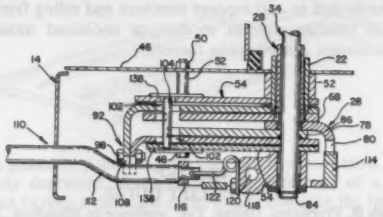
l. means for vertically moving said bottle rack up and down within said chamber of said body, said vertically moving means dependent upon opening and closing of said cover member.

4,060,157

CONTROL MECHANISM

Thomas P. Hillstrom, Hinsdale, Ill., assignor to International Harvester Company, Chicago, Ill.

Filed Aug. 20, 1976, Ser. No. 715,749
Int. Cl.[2] G05G 9/16
U.S. Cl. 192—4 A 20 Claims



1. A control mechanism for a vehicle, including:

a support rigidly attached to said vehicle, having a cam aperture with a first and second distinct elements and a transition portion therebetween, a roller retainer and a shaft aperture;

a first control assembly rotatably carried by said support in said shaft aperture, having a tubular section through said shaft aperture and a cam slot corresponding positionally to said transition and first cam aperture elements;

a first controllable member operably connected to and movable through a control range by rotation of said first control assembly;

a second control assembly rotatably carried by said first control assembly in said tubular section, having a conduit section through said tubular section and a tooth notch;

a second controllable member operably connected to and movable through a control range by rotation of said second control assembly;

a third control assembly rotatably carried by said second control assembly in said conduit section, having a shaft section through said conduit section and a cam groove corresponding positionally to said transition portion and second element;

a third controllable member operably connected to and movable through a control range by rotatation of said third control assembly;

a drive assembly rotatably carried by said tubular section and said shaft section, having a roller slot and a handle notch;

a roller constrained by said roller retainer and positioned within said transition cam element, said cam slot, said cam groove, and said roller slot;

a handle rotatably and pivotally carried by said shaft section having a rod selectively engageable with said handle notch and an extension selectively engageable with said tooth notch upon pivotal movement of said handle;

means pivotally and resiliently attached to said handle and journalled to said shaft section for mounting said handle, said means including a centering spring urging said handle to a normal position about said pivotal connection;

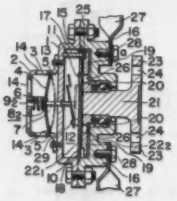
means for regulating movement of said handle by selective engagement of said tooth notch or said handle notch when said handle is in its normal position about said pivotal connection and operative, when said handle extension engages said tooth notch, to produce rotation of said second control assembly, and operative, when said handle rod engages said handle notch, to produce selective rotation of said first and third control assemblies by interaction of said roller in said cam aperture, said cam roller slot, said cam groove, and said cam slot.

4,060,158

COOLING FAN CONTROL MECHANISM

Yasuhei Kikuchi, Shizuoka, Japan, assignor to Usui International Industry, Ltd., Japan

Filed Jan. 28, 1976, Ser. No. 653,255
Int. Cl.[2] F16D 35/00, 43/25
U.S. Cl. 192—82 T 6 Claims



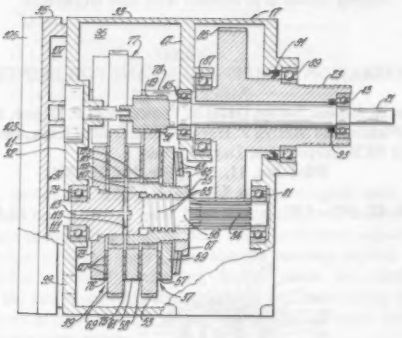
1. A control mechanism for a fluid clutch coupling a cooler fan with an engine including a mounting base; a cup-shaped, snap-deformable heat-responsive bimetal member with a central apex portion and a concave-convex section, which member is mounted by engagement of its peripheral edge in a annular groove formed in the mounting base; an actuating rod extending from the apex portion of the bimetal member adapted to actuate the fluid clutch and a coil spring disposed to apply an urging force on a central apex portion of the surface of said heat-responsive bimetal member to minimize the difference between a temperature at which the bimetal member snap deforms to couple the engine and fan, and a temperature at which the bimetal member snap deforms to decouple the engine and fan.

4,060,159

HOIST COOLING SYSTEM

Lynn Harold Chaney, Forrest City, Ark., and Glenn S. Smith, Abqaiq, Saudi Arabia, assignors to Eaton Corporation, Cleveland, Ohio

Filed May 5, 1976, Ser. No. 683,602
Int. Cl.[2] F16D 13/72, 13/74
U.S. Cl. 192—113 B 12 Claims



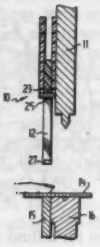
1. In a hoist, a housing, an energy absorbing device mounted in said housing, a prime mover mounted in said housing and operatively connected to said energy absorbing device, a pump mounted in said housing and operatively connected to said prime mover, an oil sump formed in said housing, oil passage means formed in said energy absorbing device for distributing oil thereto, and a cover attached to a wall of said housing, said cover having a heat exchange surface formed thereon and including an oil inlet gallery in communication with said sump and with the inlet of said pump, and an oil outlet gallery in communication with the outlet of said pump and with said oil passage means.

4,060,160

SAFETY GUARD FOR POWER OPERATED MACHINE

Raymond Stanley Lieber, P.O. Box 813, Holloman AFB, N. Mex. 88330

Filed Nov. 17, 1975, Ser. No. 632,627
Int. Cl.² F16D 71/00; H01H 3/16
U.S. Cl. 192—134 16 Claims



1. A safety guard for a power operated machine, which machine utilizes a reciprocating part, including a working tool, located above a fixed bed for supporting a workpiece, comprising;

a safety gate mounted to the reciprocating part by a connecting means and made to be free floating in at least one direction, said gate being spaced from said reciprocating part and movable in a path parallel to said working tool;

a first sensing means actuated by movement of said safety gate to sense the presence of a foreign object;

an interfacing means to interface said first sensing means with said power operated machine so the intitial motion of the reciprocating part will be stopped when the foreign object is sensed;

a second electrically conductive sensing means secured to said safety gate to sense the presence of a conductive workpiece; and

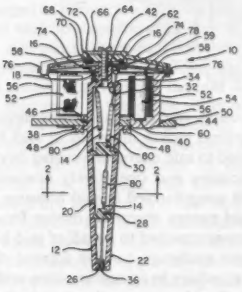
means for connecting said second conductive sensing means to said power operated machine through said conductive workpiece and said interfacing means for continuing the initial motion of said reciprocating part while said second sensing means is in contact with said workpiece.

4,060,161

VIBRATION DAMPENING MEANS FOR PRINTING MECHANISM

Carl R. Nelson, Derby; David R. Pierce; Noel F. Depew, both of Wichita, and Marlyn F. Harp, Winfield, all of Kans., assignors to NCR Corporation, Dayton, Ohio

Filed Jan. 11, 1977, Ser. No. 758,521
Int. Cl.² B41J 3/04
U.S. Cl. 197—1 R 11 Claims



1. A printing mechanism comprising:

frame means including at least two support members;

at least one elongated printing element extending through and supported by said support members and capable of being driven in an axial direction to effect printing;

driving means operatively connected to said printing element for axially driving said element; and

at least one tubular element having a length less than the distance between adjacent support members, and being unattached to said support members and riding freely on said printing element to dampen undesired transverse movement and vibration thereof.

4,060,162

RIBBON LIFT GUIDE

Kenneth R. Frechette, Dallas, Tex., assignor to Stamford, Xerox Corporation, Stamford, Conn.

Filed May 27, 1976, Ser. No. 690,684
Int. Cl.² B41J 1/24
U.S. Cl. 197—53 5 Claims

1. In a printer having a platen for supporting a record medium, a laterally movable carrier for traversing a print line, a printing mechanism supported on said carrier for printing characters on said record medium, wherein said printing mechanism includes a print hammer, rotatable daisy wheel print element including a hub, a plurality of spokes extending radially outward from said hub and each spoke terminating in a character slug with a print surface and an impact surface, a ribbon supply means, a ribbon feed means for feeding an ink ribbon past said print element and a ribbon lift means for positioning said ribbon between a first position and then a second position for printing; an improved ribbon lift guide comprising:

a substantially circularly shaped flexible disc member coupled to the hub of the print wheel element on the side of the print wheel containing the print surface of the character slug and positioned in a first plane formed by the print surfaces of said character slugs, said first plane being parallel to and a predetermined distance from a second plane formed by said spokes, said disc having a radius of a predetermined value less than the distance from the center of the hub to the closest point on the print surface of the character slug, the distance between the outer periphery of the disc and the closest point on the print surface being less than the height of the ribbon, said disc being coaxial with the print wheel to guide the ribbon to a print position with respect to the print surfaces during ribbon lift operation; and

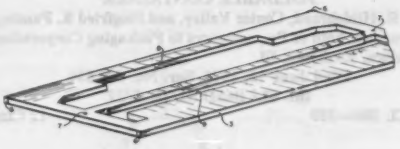
an annular member positioned between the disc and the spokes and coupled to the disc to maintain the disc in operable relationship with the print surfaces, said member being coaxial with the disc.

4,060,163

KEYBOARD GUARD

James S. Willingham, No. 1 Shari Drive, Des Peres, Mo. 63122

Filed Feb. 12, 1976, Ser. No. 657,620
Int. Cl.[2] B41J 29/04
U.S. Cl. 197—105 13 Claims



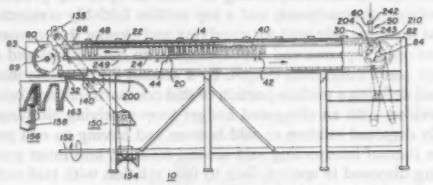
1. A guard for protecting the keys of a keyboard from being untimely depressed, comprising a guard formed of a rigid material having a thickness equal to or exceeding the heighth of the keys above the keyboard, said guard having at least one aperture provided therethrough allowing for projection of the keys therein when the guard is emplaced, said guard providing for totally surrounding the sides of the composite keys arranged therein to prevent their lateral contact, said guard being reversible upon the keyboard, and said guard aperture generally conforming to the arrangement of the keys upon the keyboard to provide for a proximity of the guard with respect to the surrounded keys.

4,060,164

METHOD AND APPARATUS FOR LOADING BLOW MOLDING MACHINES

Joseph R. Reilly, Naugatuck, Conn., assignor to Monsanto Company, St. Louis, Mo.

Filed Dec. 29, 1975, Ser. No. 645,052
Int. Cl.[2] B65G 37/00
U.S. Cl. 198—424 4 Claims



1. A method of charging hot preforms to loading hoppers circularly moving in a substantially horizontal plane at a blow molding machine which comprises:

Linearly continuously advancing such preforms supported in side-by-side relationship above such hoppers; and

Selectively removing supports from beneath individual ones of the side-by-side positioned preforms according to a predetermined sequence to permit each preform to drop by gravity into a particular one of said hoppers then passing beneath it.

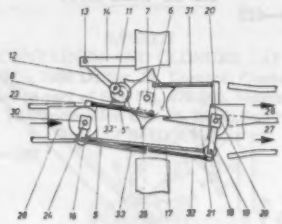
4,060,165

DIVERTER FOR DISTRIBUTING ARTICLES SUPPLIED IN ONE LINE AMONGST A PLURALITY OF CONVEYING TRACKS

Everhard Bauer, Hudeweg 2, 479 Padervorn, Germany

Filed May 11, 1976, Ser. No. 685,256
Claims priority, application Germany, May 12, 1975, 2521054; June 6, 1975, 2525356
Int. Cl.[2] B65G 47/26
U.S. Cl. 198—442 9 Claims

1. Apparatus for distributing articles supplied in one line to a plurality of conveying tracks, comprising lateral guides which bound a passage for the articles to be distributed, said guides being pivotable about a vertical axis disposed at the inlet region of the guides, a starwheel rotatable about a vertical axis mounted on one lateral guide and arranged to project into the pivotable passage formed by the guides so that it is stepped by one tooth by each of the articles passing through, wherein said



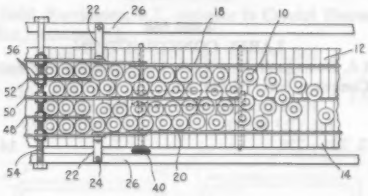
starwheel is connected to gear means that drive a crank on which there is mounted a pivotable steering member of which the other end is pivotably mounted about a stationary vertical axis so that the free end of the passage formed by the guides swings between the conveying tracks upon rotation of the starwheel.

4,060,166

CONTAINER SEPARATOR

Thomas P. Hartness, 305 Bridgewater Drive, and Robert G. Hartness, 203 Wilmington Road, both of Greenville, S.C. 29607

Filed Nov. 5, 1976, Ser. No. 739,126
Int. Cl.[2] B65G 27/10
U.S. Cl. 198—446 3 Claims



1. A device for aiding in separating a comingled mass of containers being moved on at least a pair of driven conveyor belts into rows, said conveyor belts being positioned adjacent each other with the inner edges thereof running parallel to each other, vertically extending divider plates are carried above the conveyor belts for separating and maintaining the containers in rows as they are moved on the conveyor belts, said device comprising:

a. an eccentrically mounted cam carried below said conveyor belts in engagement with the inner edges of said belts directly ahead of said divider plates, and

b. means for alternately raising and lowering said cam means causing said inner edges of said conveyor belts directly ahead of said divider plates to be reciprocally raised and lowered, said containers being moved on said belts being raised and lowered with said belts,

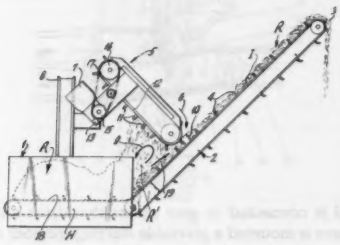
whereby the movement of said containers caused by being raised and lowered prevents said containers from becoming jammed against the ends of said divider plates as they are separated into rows.

4,060,167

METHOD FOR CONVERTING INTERMITTENT TO CONSTANT REFUSE FLOW

George Edwin Smith, East Amherst, N.Y., assignor to Union Carbide Corporation, New York, N.Y.

Filed July 12, 1976, Ser. No. 704,385
Int. Cl.[2] B65G *15/00*
U.S. Cl. 198—622 5 Claims



1. A method for providing surge capacity and for smoothing out the flow rate of refuse in a refuse feed system wherein refuse is loaded onto a moving conveyor at variable or intermittent rates, comprising:

1. preventing excess refuse from passing beyond a given point on the conveyor by providing a rotating leveler spaced at a predetermined distance from the conveyor so as to permit a desired level of refuse to remain on the conveyor beyond the leveler, and
2. rotating the leveler at a surface speed greater than twice the speed of the conveyor, the direction of travel of the leveler being opposite to the direction of travel of the refuse on the conveyor,

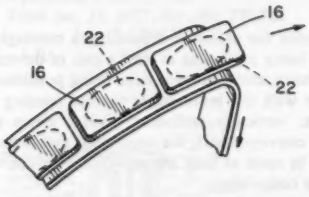
whereby refuse in excess of the amount desired to be retained on the conveyor is caused to be retained behind the leveler as a rolling inventory of refuse, thereby causing the refuse to be discharged from the conveyor at a constant and uniform rate.

4,060,168

LABEL CONSTRUCTION

Robert A. Romagnoli, New York, N.Y., assignor to Fleming-Potter Company, Inc., Peoria, Ill.

Filed Oct. 31, 1975, Ser. No. 627,593
Int. Cl.[2] B65D *75/54, 77/28;* B32B *31/18*
U.S. Cl. 206—216 14 Claims



1. An improved label assembly comprising, in combination:

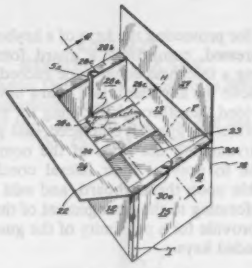
a. a plurality of separate labels, each of said labels having a print side and an adhesive side; and
b. label backing material, said backing material including a plurality of cut portions, each of said cut portions having a smaller area than said separate labels, each of said cut portions having a side for printing, said backing material having said labels separated and mounted thereon with the adhesive side of each label being in generally opposed relation to one of said cut portions, said separate labels, backing strip and cut portions positioned so that said separate labels are carrried on said backing strip and when said labels are removed from said backing strip said cut portion is also removed from said backing material in opposed relation to said separate label.

4,060,169

FOLDABLE CONTAINER

Larry R. Hildebrand, Center Valley, and Siegfried K. Pausinger, Allentown, both of Pa., assignors to Packaging Corporation of America, Evanston, Ill.

Filed June 16, 1976, Ser. No. 696,534
Int. Cl.[2] B65D *85/18, 5/22*
U.S. Cl. 206—289 12 Claims



1. A foldable container formed from a single blank of sheet material for accommodating a product having a hanger loop associated therewith, said container comprising a bottom for subtending the accommodated product; a pair of opposed side walls extending angularly from said bottom; a pair of opposed end walls extending angularly from said bottom and disposed intermediate said side walls, adjacent walls being integral with one another and separted from one another by a foldline, said walls and bottom cooperating to form an open top product-receiving compartment; and a top section foldably connected to at least one side wall for overlying and closing the compartment open top; one end wall including an outer panel and an inner panel connected thereto by a second foldline, the inner panel defining a surface portion of said compartment and being provided with an elongated hanger loop-receiving slot angularly disposed relative to said bottom and having an end portion thereof intersecting said second foldline, said inner panel being disposed in spaced, face to face relation with said outer panel and being foldably connected thereto.

4,060,170

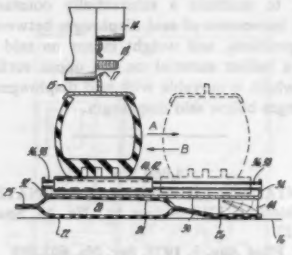
TIRE MOUNT-DISMOUNT MECHANISM

David F. Walters, Royal Oak, Mich., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Oct. 8, 1976, Ser. No. 730,919
Int. Cl.[2] B60B *29/00*
U.S. Cl. 214—331 1 Claim

1. Vehicle tire mount-dismount mechanism comprising an inflatable-deflatable pillow (**20**) having a flap-like extension (**26**) adapted to rest on the terrain surface; an upstanding foot structure (**44**) of rectangular cross-section and of a given height carried on the extension remote from the pillow; a rigid base (**30**) extending along the upper surface of the pillow and onto the foot structure, whereby said base is conjointly supported by the pillow and foot structure; two parallel support rods (**36** and **38**) mounted on said rigid base in spaced apart relation; and cradle-forming rollers (**40** or **42**) individually slidable and rotatable on the support rods; the rollers having axial lengths slightly greater than the tread width of a vehicle tire; the support rods having lengths at least twice the lengths of the rollers; the mechanism being constructed so that the pillow and rollers are positionable directly beneath a tire on the

vehicle, whereby the pillow can be inflated to elevate the rollers into weight-absorbing engagement with the tire; the support rods being of such length that the cradled tire can be drawn away from the vehicle to a position completely disengaged from the vehicle axle; the rollers being freely rotatable on the support rods whereby a cradled tire is enabled to roll on the roller surfaces as said tire is turned about its axis during a



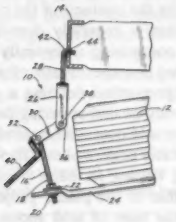
stud-hole alignment operation, said rigid base comprising a plate having upturned edges at opposite ends of the plate; said support rods having their ends anchored in holes in said upturned edges of the plate, whereby the plate-rod assembly functions as a single movable unit and further the said given height of the foot structure is approximately equal to the height of the pillow when said pillow is inflated.

4,060,171

QUICK CATCH AND RELEASE CLAMP FOR RELEASEABLY HOLDING A SPARE TIRE OF A VEHICLE

Duane H. Ludwig, Box 216, Sioux Rapids, Iowa

Filed Apr. 8, 1976, Ser. No. 675,152
Int. Cl.² B62D *43/04*
U.S. Cl. 214—451 **8 Claims**



1. A quick catch and release clamp for supporting a tire beneath the frame of a vehicle comprising,

an upstanding support post having top and bottom ends, said bottom end being adapted for rigid but detachable attachment to a tire-holding brace,

a clamp means comprised of an inverted U-shaped bottom member extending toward the top of said support post and a rigid inverted L-shaped hooked top member fixedly attached to the bridge portion of said U-shaped member and projecting outwardly therefrom, adapted for engaging an aperture of said vehicle frame for releasable securement thereto,

a toggle link pivotally mounted at one end to the top portion of said support post and pivotally mounted at its other end to the bottom portion of said clamp means,

means to move part of said toggle link, including the pivotal mounting thereof to the top portion of said support post, above the pivotal mounting at said other end of said toggle link and past the longitudinal axis of said clamp means to a locked position, and

a tire holding brace means associated with said support post for movement into a tire securing position upon movement of said toggle link to its locked position,

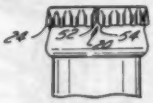
whereby when said clamp means is in its unlocked position the L-shaped hooked member may be easily released from said aperture and the brace means lowered to facilitate loading or unloading of a tire.

4,060,172

CONTAINER AND CLOSURE CAP

Arnaldo Amabili, 7680 Dollier, St. Leonard, Quebec, Canada

Continuation-in-part of Ser. No. 670,060, March 24, 1976, abandoned. This application Oct. 26, 1976, Ser. No. 735,783
Int. Cl.² B65D *41/12*
U.S. Cl. 215—295 **10 Claims**



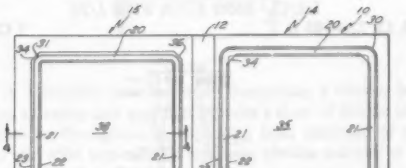
1. In combination, a container comprising a body portion enclosing a cavity adapted to retain a commodity therein, a dispensing aperture communicating with said cavity, and a cylindrical neck having a rim surrounding said aperture; and, a closure cap, said closure cap comprising a top crown covering said aperture and seating on said rim, and a skirt depending from said top crown in a sealing relationship with said neck, said skirt having a pair of diametrically opposed slots therein, said slots being defined by a pair of side walls and a top wall, each of said slots extending from a free marginal edge of said skirt to said top crown, said side walls merging arcuately with the free marginal edge of said skirt and with the top wall, said side walls being spaced apart proximate the top wall and tapering inwardly in the direction of the free marginal edge.

4,060,173

CONTAINER

Nils J. Dahl, Barrington, R.I., assignor to Crystal Thermoplastics, Inc., Ashton, R.I.

Filed Nov. 15, 1976, Ser. No. 741,861
Int. Cl.² B65D *1/34, 1/44, 5/36*
U.S. Cl. 220—4 B **2 Claims**



1. A container formed from a flexible sheet of resilient thermoplastic resin and having a body section and a cover section hinged together by a hinge integral with both sections, each section having a closure wall with side and end walls of a size to telescope one into the other when the sections are in closed relation, said side and end walls meeting in angular relation to form corners, all of said corners of the inner telescoping walls being undercut in a plane at an angle to both meeting walls on their outer surfaces and all of said corners of the outer telescoping walls being undercut in a plane at an angle to both meeting walls on the inner surfaces whereby the undercut

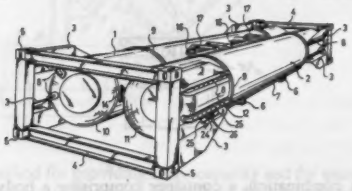
corners of the sections will lock at all of the corners when the body and cover sections are in closed position.

4,060,174

SELF-CONTAINED DOUBLE-TUBULAR TRANSPORT CONTAINER

Helmut Gerhard, Weitefeld, Sieg, Germany, assignor to Westerwalder Eisenwerk Gerhard KG, Germany

Filed Sept. 17, 1975, Ser. No. 614,308
Claims priority, application Germany, Sept. 26, 1974, 7432279[U]
Int. Cl.² B65D *21/02*
U.S. Cl. 220—23.4 14 Claims



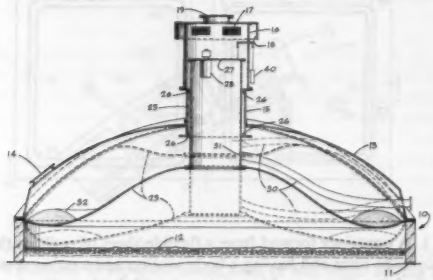
1. A self-contained double-tubular transport container comprising two end sections with corner fittings for stacking and lifting the container; two adjacent cylindrical liquid tanks extending between the end sections; upper and lower saddle elements arranged diagonally with respect to the tank cross-section for connecting the cylindrical tanks to the end sections; at least two intermediate saddles arranged at different locations along the length of the container and extending along the underside thereof transversely to a longitudinal direction for interconnecting the cylindrical tanks; transverse connecting members arranged above the horizontal center line of the cylindrical tanks; and first, second and third T-members welded to suitable regions of the cylindrical tanks, said T-members extending in the longitudinal direction of said tanks and being bolted respectively to the saddle elements, the intermediate saddle and the transverse connecting members.

4,060,175

DIAPHRAGM TANK COVER

John R. Rysgaard, Sr., St. Paul, Minn., assignor to Fiberglass Specialty Co., Inc., St. Paul, Minn.

Filed July 2, 1976, Ser. No. 702,218
Int. Cl.² B65D *87/08*; F17B *1/26*
U.S. Cl. 220—85 B 7 Claims



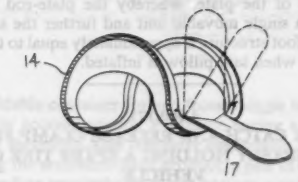
1. In a tank for anerobic digestion of sludge including a wall forming a container for holding sludge and a fixed outer cover mounted over said tank, the improvement comprising a flexible diaphragm sealingly attached to said wall and overlying said tank below said cover and above sludge in the tank to form a gas tight chamber below the diaphragm, said diaphragm being supported at its periphery on said wall and spaced above sludge in the tank, a vent stack for regulating pressure attached to said diaphragm in the center portions thereof and opening directly to the chamber below the diaphragm and, passing through said fixed cover, means to slidably guide said vent stack with respect to said cover to guide said diaphragm and permit said diaphragm and stack to move between upper and lower positions spaced at different heights above said sludge as a function of gas volume under said diaphragm formed by said sludge, and to maintain a substantially constant pressure through out movement of said diaphragm between its upper and lower positions, and weight means on said diaphragm comprising a ballast material on the upper surface of said diaphragm which is movable with said diaphragm as the gas volume changes below said diaphragm.

4,060,176

CONTAINER LID-SPOON COMBINATION

John R. Tobiasson, 3315 Steiner St., No. 15, San Francisco, Calif. 94123

Filed Aug. 8, 1975, Ser. No. 603,095
Int. Cl.² B65D *51/24*
U.S. Cl. 220—212 8 Claims



1. A container lid convertible between the first position to function as a lid for closing the top of a container for food and a second position wherein it is folded to function as a spoon for removing and eating the contents of the container, comprising:

in its first position a generally disc-shaped, snap-on food container lid comprising a generally discoidal removable planar covering for the mouth of said container, and a peripheral edge portion defining a rim channel circumscribing the body of said covering for receiving a complimentary lip on said container, said rim channel having an inner and an outer edge; a planar flap at the mid-portion of said covering having an edge contour generally corresponding to that of the planar projection of a bowl of a spoon with the base of said spoon bowl edge contour permanently secured to said covering along a straight fold line that extends between two points at least closely adjacent said inner edge of said rim channel of said covering; and

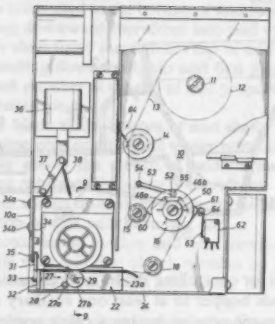
in its second position a spoon having said flap bent on said straight fold line at said base outward from said covering through approximately 180° from said first position so as to be overlapping said rim channel; said flap projecting outwardly from said covering and said rim channel for a major portion of its length as measured along the longitudinal axis of said flap perpendicular to said straight fold line; both said covering and said rim channel being folded upon themselves about the longitudinal axis of said flap so that said flap is curved about its longitudinal axis to form a spoon bowl, so that the fold line and the corresponding arcuate shape of said rim channel and said covering overlaid by said flap provide structural rigidity to the connection between said spoon bowl and said handle, and said rim channel strengthens said peripheral edge portion to resist bending under pressure of said spoon bowl when said spoon bowl is in use.

4,060,177

STAMP DISPENSING APPARATUS

John L. Surber, Jr., 11818 Warfield Drive, San Antonio, Tex. 78216

Continuation of Ser. No. 548,248, Feb. 10, 1975, abandoned. This application July 22, 1976, Ser. No. 707,656
Int. Cl.[2] G07F 11/66
U.S. Cl. 221—25 6 Claims



1. Apparatus for dispensing items, such as stamps, tickets, and the like from an elongated web of said items formed by a plurality of the items connected through a backing strip, rows of perforations, and the like, comprising a housing having an opening through which the web is moved when such items are being dispensed, means for moving the web through the opening, means for actuating the web moving means, means for stopping the web moving means when a preselected number of such items have been dispensed, and means to position the web for the dispensed item or items to be severed at a connection between such items and the remaining web, said positioning means including a wheel mounted to rotate freely around an axis transverse the direction of movement of the web, said wheel being positioned for the web to wrap around a portion of the wheel as it moves toward the dispensing opening and having a plurality of ridges parallel to the axis of rotation and spaced to engage the web at the connections between the items forming the web as the wheel is rotated by the moving web, and means providing a resilient force on the web to hold the web in engagement with the wheel sufficient to prevent slippage between the wheel and the moving web, and said means for stopping the web moving means including means responsive to the position of the wheel to stop the web moving means when a preselected number of such items have been dispensed.

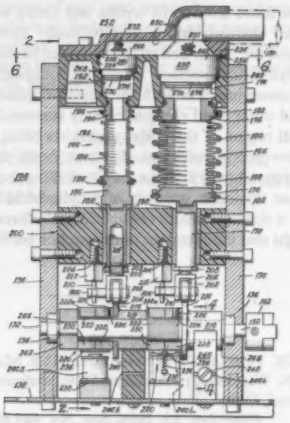
4,060,178

METERING PUMP

Herbert L. Miller, Roselle, Ill., assignor to Miller Mfg. Co. of Schiller Park, Inc., Addison, Ill.

Continuation of Ser. No. 468,935, May 10, 1974, abandoned, which is a division of Ser. No. 305,255, Nov. 10, 1972, Pat. No. 3,851,798. This application Aug. 18, 1975, Ser. No. 605,630
Int. Cl.[2] G01F 11/08; F04B 9/04, 13/00
U.S. Cl. 222—14 9 Claims

1. A metering pump comprising a pair of positive displacement pumping chambers having different displacement volumes, liquid supply passage means having an inlet and in communication with both of said pumping chambers, inlet check valve means for permitting liquid flow into said pumping chambers during expansion thereof from said liquid supply passage means, liquid discharge passage means having an outlet and in communication with both of said pumping chambers, outlet check valve means for permitting the discharge of metered liquid from said pumping chambers upon contraction of the same into said discharge passage means, power means for expanding and contracting said respective chambers automatically through a preselected number of repetitive identical pumping cycles, and means independently controllable for each of said pumping chambers for automatically and selectively interconnecting of disconnecting said power means and



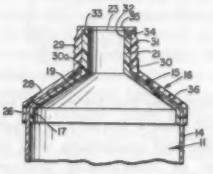
a respective pumping chamber for operating each pumping chamber for a required number of cycles corresponding to said preselected number to automatically meter a precise volume of liquid into said discharge passage means.

4,060,179

COLLAPSIBLE TUBE STRUCTURE

Russell Park McGhie, Somers, N.Y., assignor to Colgate-Palmolive Company, New York, N.Y.

Continuation of Ser. No. 249,658, May 2, 1972, abandoned. This application July 26, 1974, Ser. No. 492,213
Int. Cl.[2] B65D 35/00
U.S. Cl. 222—92 4 Claims



1. A collapsible tube assembly comprising a tubular body having a flexible side wall that includes a sheet of ductile metal coextensive throughout, a dispensing head structure of relatively stiff solid non-metallic synthetic plastics material at one end of said body, said head structure comprising an integral inner element composed of relatively hard synthetic plastics material having an annular tapered shoulder and an annular skirt around the larger end of the shoulder having an external smooth cylindrical surface extending longitudinally from an annular corner junction with the outer periphery of said shoulder, said body at one end having a longitudinally extending cylindrical wall region of appreciable area closely surrounding said cylindrical skirt surface and terminating in an annular end region inwardly turned over said junction to overlie the outer surface of said shoulder in a substantially dead fold crimped condition, and an integral outer element of said head structure composed of a relatively resilient synthetic plastic material having an annular tapered shoulder closely overlying said shoulder of the inner head element to clamp said crimped inturned body end region between said shoulders to anchor said body against longitudinal separation from said head struc-

ture, a reduced diameter hollow neck projecting axially from the smaller end of the shoulder of said outer head element, a hollow neck projecting axially from the smaller end of the shoulder of said inner element axially forced into a tight smooth surfaced friction fit within and lining said neck of the outer head element, and a longitudinally extending annular skirt around the larger end of the shoulder having an internally smooth cylindrical surface extending longitudinally from an annular corner junction with the outer periphery of the shoulder of said outer head element closely surrounding said cylindrical wall region of the body, said skirts being longitudinally coextensive for a sufficient distance from their respective shoulder junctions to define a longitudinal space between them of constant thickness wherein said cylindrical wall region of the body is tightly radially clamped with a force fit to provide a fluid tight seal independent of the anchor between said shoulders.

4,060,180

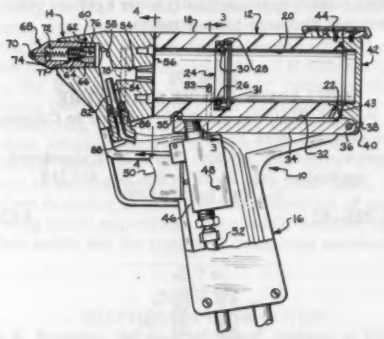
TOOL FOR APPLYING ADHESIVE MATERIAL

Howard N. Wieland, Jr., Amherst, Ohio, assignor to TRW Inc., Cleveland, Ohio

Filed Jan. 12, 1976, Ser. No. 648,494

Int. Cl.² B67D *5/62*

U.S. Cl. 222—146 HE **9 Claims**



1. An adhesive-applying tool for melting and applying adhesive to a workpiece from a plurality of sequentially fed adhesive cartridges, said tool comprising wall means forming an elongate chamber of substantially uniform cross section throughout its length, heat-conducting means located at one end of said chamber and having an outlet passage communicating with said chamber, said heat-conducting means being effective to heat and melt an end of one of the cartridges in contact with said heat-conducting means at said one end of said chamber, means for closing off the other end of said chamber, resilient sealing means carried by said wall means and extending into said chamber at an intermediate position between said heat-conducting means and said closing means and effective to engage the outer surface of the cartridges of adhesive material inserted into said chamber, said sealing means being fixed and being spaced substantially rearwardly from said heat-conducting means and the melted ends of the cartridges, means for supplying fluid under pressure directly to said other end of said chamber, said sealing means being effective to substantially prevent the passage of fluid under pressure past said sealing means toward said outlet passage, and vent means communicating with said chamber and located proximate said sealing means to vent any fluid under pressure which might leak past said sealing means to prevent the fluid under pressure from directly acting on the molten adhesive to force the molten adhesive from said outlet passage.

4,060,181

METHOD AND APPARATUS FOR CONTROLLING THE TRANSFER OF PARTICULATE MATERIAL

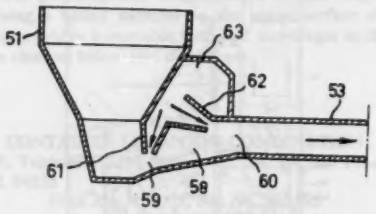
Xavier Roger Grataloup, Montereau, Siene et Marne, France, assignor to Nodet-Gougis (Societe de droit francais), France

Filed June 28, 1976, Ser. No. 700,500

Claims priority, application France, July 3, 1975, 75.20987; Feb. 9, 1976, 76.03519

Int. Cl.² B65D *83/06*

U.S. Cl. 222—193 **15 Claims**



1. A method for controlling the transfer of particulate material from a main hopper to at least one auxiliary storage unit through a hermetic conduit having a rising portion, in which method the particulate substance is entrained in a gas stream whose flow rate varies with the filling of the auxiliary storage unit from the main hopper, wherein the improvement comprises the steps of: forming said auxiliary storage unit to have an increasing resistance to gaseous flow thereinto as the level of particulate material rises therein, creating a partial vacuum at a location in the conduit with the pressure at said location rising as the auxiliary storage units fills with the pressure reaching at least zero when the auxiliary storage unit is full; and introducing the particulate material into the gas stream substantially at said location.

4,060,182

BOTTLE WITH ELECTRICALLY-OPERATED PUMP

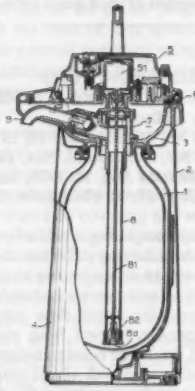
Yoshito Kikuchi, 7-37, Otani, Nishinomiya, Hyogo, Japan

Filed Mar. 10, 1976, Ser. No. 665,435

Claims priority, application Japan, Mar. 10, 1975, 50-32783; Mar. 12, 1975, 50-34058; Mar. 12, 1975, 50-34059; Mar. 14, 1975, 50-34850

Int. Cl.² B67D *5/48*; F04B *49/02*

U.S. Cl. 222—333 **9 Claims**



1. A container with an electrically operated pump comprising:

a casing open at the top thereof;

a vacuum bottle within said casing, said vacuum bottle having an open mouth at the top thereof;

a funnel-like pour member fitted over the top portion of said casing, the bottom of said member having an opening therein at least as large as the outside diameter of the mouth of said vacuum bottle and fitted around the mouth of said vacuum bottle in the open top end of said casing;

a hollow fistulous plug fitted within the opening in said pour member and extending downward thereform into the mouth of said vacuum bottle;

a first pipe connected to the bottom of said fistulous plug and extending downward therefrom into said vacuum bottle;

a propeller shaft fitted through the top of said fistulous plug and extending downward into said first pipe;

a first clutch member at the top of said propeller shaft above said fistulous plug;

a propeller blade at the bottom of said shaft;

a second pipe connected to the upper portion of said fistulous plug above the mouth of said vacuum bottle and extending substantially laterally therefrom;

box member means fitted over said pour member for covering the top of said pour member; and

electric motor means within said box member means and engagable with said first clutch member on said propeller shaft for rotating said shaft, said motor means comprised of:

a battery operated electric motor having a rotary shaft extending therefrom,

a second clutch member attached to the end of said rotary shaft and engagable with said first clutch member when said box member is positioned over said pour member;

at least one dry cell battery for operating said motor, and

switch means for operating said electric motor.

4,060,183

APPARATUS FOR PORTIONING OF A SOLID VEGETABLE RAW MATERIAL

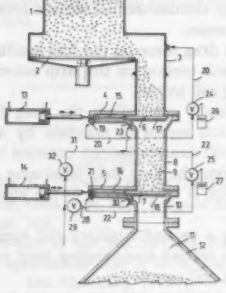
Juhani Puurunen, Pietniemi, Finland, assignor to Oy W. Rosenlew AB, Pori, Finland

Filed June 14, 1976, Ser. No. 695,757

Claims priority, application Finland, June 17, 1975, 751798

Int. Cl.² G01F *11/36*

U.S. Cl. 222—442 **2 Claims**



1. An apparatus for feeding a solid vegetable raw material into a reactor under pressure through a vertical sluice channel limited by gate means, which apparatus comprises a storage space for the raw material to be fed, a vertical shoot leading from the storage space into the reactor under pressure, at least two slide-type gate means that close the shoot and that define in said sluice channel a sluice space between said gate, actuating means having slide chambers for opening said gate means alternatingly in order to connect said sluice space alternately to the vertical shoot above the gate means and to said reactor, and pressure-levelling channels which pass from the sluice space to said vertical shoot above said gate means and to the reactor under pressure, respectively, so as to bring the sluice space alternately in pressure connection with same, wherein the respective pressure-levelling channels are connected to the slide chamber means of said gate means, but positioned remote from the sluice space so that, before the gate means are opened, the pressure-levelling vapor escaping from the sluice space to the shoot and from the reactor to the sluice space respectively are connected via said slide chambers.

4,060,184

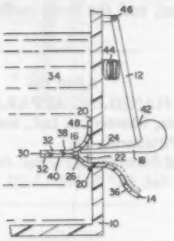
LIQUID DISPENSING CONTAINER

Thomas O'Neil, Sr., 10810 S. Trumbull, Chicago, Ill. 60655

Filed May 4, 1976, Ser. No. 683,010

Int. Cl.² B65D *5/72*

U.S. Cl. 222—501 **2 Claims**



1. The liquid dispensing container comprising a container for the storage of liquid therein, said container having an opening, self closing valve means for selective dispensing of said liquid from said container, said valve means fixedly secured to the interior surface of said container adjacent the entire marginal edges of said opening, said valve means self biased into a closed position preventing said dispensing of said liquid, said valve means responsive to the presence of said liquid within said container, said liquid when within said container urging said valve means in said closed position, valve opening means for manually manipulating said valve means into an open position, wherein said valve means is heat sealed to said container, wherein said valve means is disposed within the liquid storing portion of said container, wherein said valve means comprises a flexible thermoplastic material having a generally tubular shape, one end of said tubular shape having an outwardly radially extending flange, the other end of said tubular shape having the innermost surfaces adjacent thereto in touching engagement, said innermost surfaces being disposed in said touching engagement by the thermoplastic properties comprising said flexible material, wherein said valve opening means comprises a tapered rod, hinging means for hingeably affixing said tapered rod to the outermost surface of said container, biasing means for biasing said tapered rod outwardly from said outermost surface, said tapered rod being disposed through said opening when said biasing means is manually overridden.

4,060,185

BAND FOR WRIST-WATCH

Yoshiyuki Kuroda, Tokyo, Japan, assignor to Citizen Watch Co., Ltd. and Sunarrow Koski, Co., Ltd., both of Tokyo, Japan

Filed Oct. 24, 1975, Ser. No. 625,477

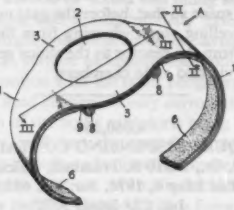
Claims priority, application Japan, Oct. 25, 1974, 49-123184

Int. Cl.² A44C *5/12*

U.S. Cl. 224—4 F **7 Claims**

1. A band for a wrist-watch adapted to fit the arm of a user comprising a thin elastic metal plate having front and rear surfaces and first and second ends, a mounting hole through said metal plate adapted for mounting said wrist-watch behind said mounting hole with the back of the watch adjacent to said rear surface and the face of said watch protruding partly

through said mounting hole, the ends of said metal plate forming a wrist encircling portion for the arm, and the metal plate being one piece, resilient material bonded to the rear surface of said wrist encircling portion, and said resilient material being



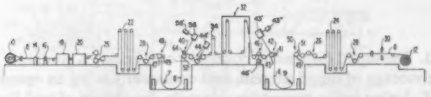
wider than said wrist encircling portion whereby said resilient material protrudes outward beyond the side edges of said wrist encircling portion, and the front surface of said metal plate being exposed.

4,060,186

METAL STRIP HANDLING APPARATUS AND METHOD

George A. Nabhan, Chesterton, Ind., assignor to National Steel Corporation, Pittsburgh, Pa.

Filed Nov. 18, 1975, Ser. No. 629,124
Int. Cl.[2] B65H *17/20, 23/14*
U.S. Cl. 226—1 13 Claims



1. In a continuous strip handling apparatus in which there are uncoiling means for withdrawing strip from a coil of the strip at desired strip speeds, coiling means for coiling the strip, strip treating means having an entry end and an exit end between the uncoiling means and the coiling means for carrying out a treatment of the strip which requires tension on the strip controlled independently of the tension on the strip in the remainder of the strip handling apparatus, the combination comprising

a. loop forming means for forming a free hanging loop in the strip of varying length of strip on the uncoiling means side of the strip treating means,

b. the loop forming means comprising drag strip tensioning roll means on the strip exit side of the free hanging loop for withdrawing strip from the free hanging loop,

c. drag generator means associated with the drag strip tensioning roll means for placing controlled back tension on the strip being withdrawn from the loop as the strip moves toward the entry end of the strip treatment means,

d. first auxiliary roll means interposed between the free hanging loop and the drag strip tensioning roll means arranged to make continuous surface contact with the strip over an appreciable circumferential surface area of the auxiliary roll means,

e. independent drag generator means connected to the first auxiliary roll means for placing back tension on the strip entering the drag strip tensioning roll means,

f. independent control means associated with the independent drag generator means for maintaining by means of the first auxiliary roll means a desired back tension on the strip entering the drag strip tensioning roll means, which back tension is independent of the weight of the strip in the loop,

g. second loop forming means for forming a second free hanging loop in the strip of varying length on the coiling means side of the strip treating means,

h. the second loop forming means comprising drive strip tensioning roll means on the strip entry side of the free hanging loop for pulling strip at controlled speed through the strip treating means and feeding strip into the free hanging loop,

i. second auxiliary roll means interposed between the second free hanging loop and the drive strip tensioning roll means arranged to make continuous surface contact with the strip over an appreciable circumferential surface area of the second auxiliary roll means,

j. independent driving motor means connected to the second auxiliary roll means for placing pulling tension on the strip leaving the drive strip tensioning roll means, and

k. second independent control means associated with the independent driving motor means for maintaining by means of the second auxiliary roll means a desired constant pulling tension on the strip leaving the drive strip tensioning roll means, which pulling tension is independent of the weight of the strip in the loop.

9. In the operation of a continuous strip handling apparatus in which there are uncoiling means for withdrawing strip from a coil of the strip at desired strip speeds, coiling meand for coiling the strip, strip treating means having an entry end and an exit end between the uncoiling means and the coiling means for carrying out a treatment of the strip which requires tension on the strip controlled independently of the tension on the strip in the remainder of the strip handling apparatus, loop forming means for forming a free hanging loop in the strip of varying length of strip on the uncoiling means side of the strip treating means, the loop forming means comprising drag strip tensioning roll means on the strip exit side of the free hanging loop for withdrawing strip from the free hanging loop, drag generator control means for placing controlled back tension on the strip being withdrawn from the loop as the strip moves toward the entry end of the strip treatment means, and in which there are second loop forming means for forming a second free hanging loop in the strip of varying length on the coiling side of the strip treating means, the second loop-forming means comprising drive strip tensioning roll means on the strip entry side of the free-hanging loop for pulling strip through the strip treating means and feeding strip into the free-hanging loop while controlling the speed at which the strip is pulled through the strip treating means, the method comprising

a. providing a first auxiliary roll means interposed between the free-hanging loop and the drag strip tensioning roll means,

b. cause the strip to make continuous surface contact with an appreciable circumferential surface area of the first auxiliary roll means,

c. exerting a drag force on the first auxiliary roll means for placing back tension on the strip entering the drag strip tensioning roll means,

d. independently controlling the drag force on the first auxiliary roll means to maintain by means of the first auxiliary roll means a desired, constant back tension on the strip entering the drag strip tensioning roll means, which back tension is independent of the weight of the strip in the loop,

e. providing a second auxiliary roll means interposed between the second free-hanging loop and the drive strip tensioning roll means,

f. causing the strip to make continuous surface contact with an appreciable circumferential surface area of the second auxiliary roll means,

g. exerting a driving force on the second auxiliary roll means for placing pulling tension on the strip leaving the drive strip tensioning roll means, and

h. independently controlling the driving force on the second auxiliary roll means to maintain by means of the second auxiliary roll means a desired constant pulling tension on the strip leaving the drive strip tension roll means, which pulling tension is independent of the weight of the strip in the loop.

4,060,187

PROCESS AND APPARATUS FOR PERMANENTLY CONTROLLING THE MOVEMENT OF WEB OF MATERIAL CONTINUOUSLY DELIVERED TO A MACHINE PROCESSING THE WEB

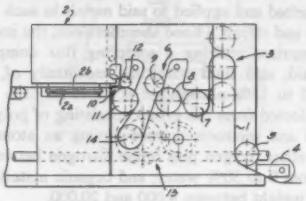
Jean Grob, Chavannes, Switzerland, assignor to J. Bobst & Fils, S.A., Switzerland

Filed Nov. 26, 1976, Ser. No. 745,245

Claims priority, application Switzerland, Nov. 26, 1975, 015311/75

Int. Cl.² B65H *17/22, 23/26*

U.S. Cl. 226—8 10 Claims



1. In a process of permanently controlling the movement of a web of material being continuously supplied at a fixed rate of speed from a web feeding means to a machine which operates sequentially on portions of the web with each portion being at a standstill while being operated by the machine, said process comprising feeding the web from the feeding means around a circumferential portion of a roller of a web take-up means and then to the machine, said web take-up means having a pair of members mounted for rotation on a first axis and supporting the roller for rotation on a second axis offset from the first axis so that during one revolution of the take-up means, the length of the path of the web between the feeding means and the machine is continuously changing, the improvements comprising changing the angular position of the second axis of the roller relative to the first axis during each rotation of the take-up means and controlling the rate of change of the angular position in response to the amount of eccentricity of the second axis to the first axis so that the portion of the web within the machine is at a full standstill for a predetermined period which is required for the machine to operate on the portion due to the eccentric movement of the roller absorbing the total length of the web being supplied from the web feeding means during the predetermined period.

4,060,188

IMPACT NAILING ARRANGEMENT

Franklin A. Monson, Glen Arm, Md., assignor to AAI Corporation, Cockeysville, Md.

Continuation-in-part of Ser. No. 367,063, June 4, 1973, abandoned. This application June 3, 1974, Ser. No. 476,010

Int. Cl.² B25C *1/12*

U.S. Cl. 227—9 13 Claims

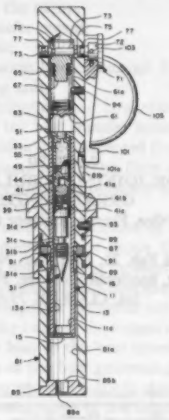
1. An impact nailing arrangement, comprising

support means,

a nail unit carried and directionally oriented by said support means,

and latent energy means disposed in energy-transmitting relation to said nail unit for imparting linear motion to said nail unit,

said nail unit having a forward penetrator section, a hammer section and a medial impact-compression shear section between said penetrator section and said hammer section, and which impact-compression shear section is impact-shearable as a function of energizing said latent energy means and resultant linear motion impacting of said penetrator section with a target object to which it is desired to be attached.



4,060,189

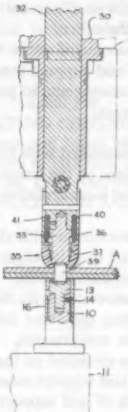
SLUG RIVETING APPARATUS

Joseph Vargo, Jr., West Seneca, and John W. Davern, North Tonawanda, both of N.Y., assignors to General-Electro Mechanical Corporation, Buffalo, N.Y.

Filed Oct. 26, 1976, Ser. No. 735,388

Int. Cl.² B21J *15/36*

U.S. Cl. 227—53 9 Claims



1. Apparatus for inserting cylindrical rivet blanks in workpieces and forming rivet heads at opposite ends thereof comprising opposed rivet head forming anvils adapted to receive workpieces therebetween, at least one of said anvils being movable toward the other, an annular elastomeric rivet blank holder having a bore coaxial with respect to said anvils and adapted to fit over the end of one of said anvils and an outer portion having a bore of slightly less diameter than a rivet blank to receive and hold the same elastically therein, said last mentioned anvil being adapted to move axially relative to said blank holder upon relative movement of said anvils toward each other to expand the blank holder radially outwardly and

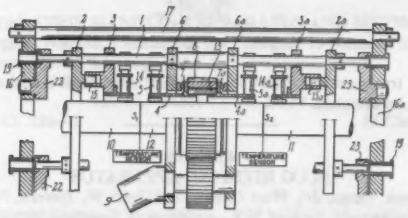
move to a rivet blank into the workpieces and against the other of said anvils under pressure to form heads at the opposite ends thereof.

4,060,190

PROCESS FOR JOINING TUBULAR MEMBERS OF GREAT LENGTH

Laurent Paolini, Nice, France, assignor to Naphtachimie, Paris, France

Filed Feb. 21, 1974, Ser. No. 444,515
Claims priority, application France, Feb. 21, 1973, 73.06063
Int. Cl.[2] B23K *19/02*
U.S. Cl. 228—2 5 Claims



1. Apparatus for assembling by friction-welding tubular components made of metal or thermoplastic material, comprising

separate support means for retaining each of the tubular components in endwise alignment with the adjacent ends spaced one from the other;

means operatively associated with the support means and forming a part of said support means for releasably gripping the tubular components to prevent rotational movement about their axes;

a frame;

means operatively associated with the frame mounting each of said support means on the frame for independent movement of one support means relative to the other in the axial direction;

means operatively associated with the frame for supporting a short tubular cuff in axial alignment between adjacent ends of the tubular components;

means operatively associated with the means for supporting the cuff for rotating the short tubular cuff between the ends of the tubular components;

separate drive means mounted on the frame and operatively engaging each of said support means for independent axial movement of each of said support means in the direction to thrust the adjacent ends of the tubular components into pressure contact with the adjacent ends of the cuff to effect softening by heat generation in response to such frictional engagement during rotational movement and to effect consolidation by welding upon cooling after movement of the cuff has been stopped;

means associated with said cuff supporting means for sensing the temperature at the frictionally engaged ends of the tubular members in engagement with the rotating cuff, said separate drive means being responsive to said temperature sensing means to suppress or decrease the thrust on the support means for the tubular component having the higher temperature for equalization of the temperature conditions existing at the respective ends.

4,060,191

METHOD OF SOLDERING WITH PHOSPHORIC ACID SOLDERING FLUX

Edward G. Choby, Jr., Pittsburgh, Pa., assignor to Allegheny Ludlum Industries, Inc., Pittsburgh, Pa.

Division of Ser. No. 535,744, Dec. 23, 1974, Pat. No. 3,985,586.
This application June 25, 1976, Ser. No. 699,833
Int. Cl.[2] B23K *1/00, 35/24*
U.S. Cl. 228—207 8 Claims

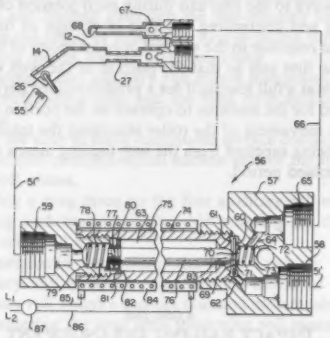
1. In the soldering of copper and copper-plated stainless steel wherein metal selected from the group consisting of copper and copper-plated stainless steel is placed in close proximity with other metal, solder and soldering flux, and wherein said solder is melted and applied to said metals in such a way that it solidifies and effects a bond therebetween; the improvement which comprises utilizing a soldering flux comprised of a viscous fluid; said fluid consisting essentially of, in weight percent, 35 to 85% phosphoric acid, 15 to 65% of organic material selected from the group consisting of polyethers and polyimines and mixtures thereof having an atomic ratio of carbon to ether oxygen plus imine nitrogen between 1.5 and 3.1, and from 0 to 30% water; and organic material having a molecular weight between 4,000 and 20,000.

4,060,192

FUEL CONTROL SYSTEM AND METHOD OF OPERATING THE SAME AND DIVERTER VALVE THEREFOR

Charles D. Branson, Greensburg, Pa., assignor to Robertshaw Controls Company, Richmond, Va.

Division of Ser. No. 558,813, March 17, 1975, Pat. No. 3,989,188. This application Aug. 19, 1976, Ser. No. 715,846
Int. Cl.[2] G05D *23/02*
U.S. Cl. 236—46 D 5 Claims

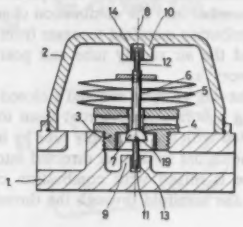


1. A diverter valve construction comprising a housing having a pair of valve seats and a movable valve member for respectively opening one of said valve seats while closing the other of said valve seats, said housing having an inlet leading between said pair of valve seats and having a pair of outlets respectively leading from said pair of valve seats, said housing carrying a rod and tube arrangement operatively associated with said valve member for moving said valve member relative to said seats upon temperature changes sensed by said rod and tube arrangement, said rod and tube arrangement having the tube thereof defining part of one of said outlets of said housing, an electrical heater operatively associated with said rod and tube arrangement for heating the same when said heater is energized, and a timer operatively associated with said heater to energize the same after a lapse of a selected time period of said timer.

4,060,193
THERMALLY CONTROLLED VALVE

Werner Füller, Stuhr-Heiligenrode, Germany, assignor to Gestra-KSB Vertriebsgesellschaft mbH & Co. Kommanditgesellschaft, Bremen, Germany

Filed June 14, 1976, Ser. No. 695,606
Claims priority, application Germany, June 23, 1975, 2527851
Int. Cl.² F16T 1/04
U.S. Cl. 236—59 7 Claims

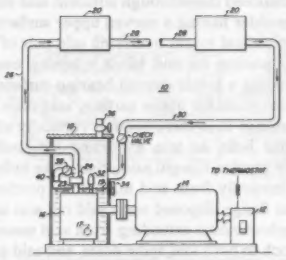


1. A thermally-controlled valve comprising:
a housing having an internal chamber which is communicative to an inlet and outlet;
a valve seat element disposed in said housing having a valve seat for communicating the outlet to the inlet;
a valve shaft slidably retained in said housing and extending through the opening defined by said valve seat and including a spherically-shaped, valve member communicative with said valve seat element;
guide bushing elements diposed in said housing and having diametrical clearances for retaining at least a portion of said valve shaft on opposite sides of said valve seat; and
a bimetallic element coupled to said shaft and in engagement with said valve seat element, for opening and closing said valve member, wherein the dimensions of the diametrical clearances between said guide bushing elements and said valve shaft portions are in a ratio with respect to each other which is proportional to the ratio of distances between the spherical center point of said valve member and the points at which said valve shaft radially engages said guide bushing elements when said valve member is in its closed position, whereby, upon engagement of said valve shaft with said guide bushing elements, said spherical center point of said valve member is aligned with the center axis of the opening defined by said valve seat.

4,060,194
HEATING SYSTEM AND ELEMENT THEREFOR

George H. Lutz, 1210 Front St., Binghamton, N.Y. 13905

Filed Mar. 8, 1976, Ser. No. 664,922
Int. Cl.² F24C 9/00
U.S. Cl. 237—1 SL 11 Claims



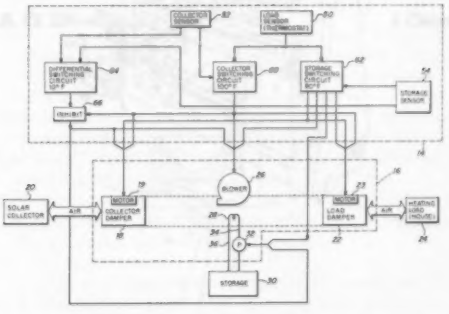
1. A closed heating system comprising:
a liquid storage tank;
a liquid in the liquid storage tank;
a pump connected to the liquid storage tank to pump liquid therefrom;
means for operating the pump;
at least one heat transfer means;
a heat generating unit;
a first liquid distribution line connected from the pump to the heat generating unit;
a second liquid distribution line connected from the heat generating unit to the heat transfer means;
a third liquid distribution line connected from the heat transfer means to the pump to thereby form a closed system;
the liquid being somewhat compressible and having a specific heat in the order of 0.86;
the heat generating unit being formed of a synthetic resin material having a melting point above 300° F and having a plurality of small holes therein through which the liquid is forced, the holes being of such size that a back compressional force is developed in the liquid not flowing through the openings thereby causing the temperature of the liquid to rise and deliver heat to the heat transfer means;
the thermal integrity of the heat generating unit being such that the back compressional force is maintained over the operating temperature range of the liquid.

9. In a closed heating system utilizing a liquid having a high specific heat as the heat transfer medium and having storage means for storing the liquid, pump means for pumping the liquid through the system, a heat generating unit to which the liquid is pumped to thereby heat the liquid, heat transfer means for transferring heat from the liquid to the ambient atmosphere, the heat generating unit comprising:
a block of synthetic resin material having a melting point above 300° F;
the block having a plurality of small longitudinal openings through which a small quantity of the liquid is forced to thereby develop a back compressional force in the liquid not flowing through the openings which causes the liquid temperature to rise;
the thermal integrity of the block being such that the back compressional force is maintained over the operating temperature range of the liquid.

4,060,195
SOLAR HEATING CONTROL SYSTEM

Felix Rapp, Jr., Marlboro, and James M. Barron, Framingham, both of Mass., assignors to DIY-Sol, Inc., Marlboro, Mass.

Filed July 26, 1976, Ser. No. 708,872
Int. Cl.² F24J 3/02
U.S. Cl. 237—1 A 2 Claims



1. A control circuit for a solar heating system having a solar collector, a heating load and a heat transfer control unit including a collector valve for controlling the flow of heating fluid to and from a solar collector; a load valve for controlling the flow of heating fluid to and from a heating load; a heating pump for moving the heating fluid; a heat exchanger; and a storage pump

for circulating a storage fluid from a storage tank through said heat exchanger; said control circuit comprising:

a load sensor for sensing the temperature of the load;

a collector sensor for sensing the temperature of the solar collector;

a collector switching circuit responsive to an indication from said load sensor that the load temperature is below a preset level and from said collector sensor that the collector temperature is above a predetermined level, to open said valves and actuate said heating pump to move the heating fluid from the load to the collector to be heated and then returned to the load;

a storage sensor for sensing the temperature of the storage fluid in the storage tank;

a storage switching circuit responsive to an indication from said load sensor that the load temperature is below a preset level and from said storage sensor that the storage fluid temperature is above a predetermined level to open said load valve, close said collector valve, actuate said storage pump to move said storage fluid internally through said heat exchanger, and actuate said heating pump to move the heating fluid for the load externally through said heat exchanger to be heated and then returned to the load; and

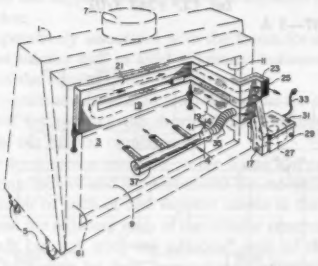
a differential switching circuit, responsive to said storage sensor and said collector sensor, upon a preestablished minimum differential between said collector temperature and said storage fluid temperature, when said collector switching circuit and said storage switching circuit are inoperative in the absence of an indication from said load sensor, for actuating said storage pump to move said storage fluid internally through said heat exchanger, opening said collector valve and closing said load valve, and activating said heating pump for moving the heating fluid from the collector externally through said heat exchanger to increase the heat stored in said storage fluid and, when said storage switching circuit is operative, to open said collector valve and activate said storage pump to preheat the heating fluid coming from said load before it reaches said heat exchanger.

4,060,196

HEAT EXTRACTOR FOR STOVES

Claude W. Goldsby, P.O. Box 7646, Salem, Oreg. 97303, and Roray J Sandau, Rte. 1, Box 729, Salem, Oreg. 97304

Filed Apr. 12, 1976, Ser. No. 676,138
Int. Cl.² F24B 7/00
U.S. Cl. 237—51 **8 Claims**



1. Apparatus for extracting head from a combustion chamber with a room, including, in combination, a combustion chamber having an open front, a floor, side walls and a back wall, and a heat extractor, the extractor comprising: a single, hollow U-shaped member defining a continuous U-shaped air path, the U-shaped member lying on a vertical plane and extending inwardly along one side wall of the combustion chamber, an air supply fan operatively connected to the U-shaped member, and combustion chamber air supply means branching from the U-shaped member into the chamber, wherein the improvement comprises:

an elongate combustion air supply tube protruding from the U-shaped member into the combustion chamber;

and an air distributing manifold separate from the U-shaped member and the air supply tube and positioned on the chamber floor;

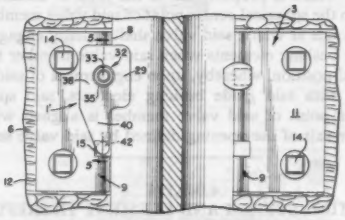
the manifold having an open end and a closed end, the open end defining a horn-shaped throat open to the chamber and associated with the air supply tube by insertion of the tube into the throat so that air directed into the manifold by the tube is mixed with combustion chamber gases drawn into the manifold through the throat.

4,060,197

RAIL FASTENER ASSEMBLY

Khurshid Ahmed Qureshi, Bolingbrook, Ill., assignor to Portec, Inc., Oak Brook, Ill.

Filed Oct. 21, 1976, Ser. No. 734,537
Int. Cl.² E01B 9/36
U.S. Cl. 238—338 **10 Claims**



1. A rail fastener including a restraining block and a tie plate, said tie plate provided with a rail seat section bounded by opposed shoulders, at least one said shoulder provided with a pair of spike holes disposed therethrough adjacent said rail seat section, said one shoulder having a curved upper surface, said block having a longitudinal extent overlying said pair of spike holes, a main body portion on said block spanning one said spike hole and including a lower curved bearing surface mating with said tie plate shoulder upper surface, said main body portion having a vertical hole therethrough vertically aligned above said one spike hole, an arm extending longitudinally from said main body portion toward said other spike hole, a lip portion extending inwardly from said main body portion and overlying a rail base flange disposed upon said rail seat section of said tie plate, anchor means extending from said main body and joining said block to both said spike holes, and said anchor means includes a multi-part fastener disposed through said one spike hole and aligned block hole and a lug depending from said arm and entering said other spike hole.

4,060,198

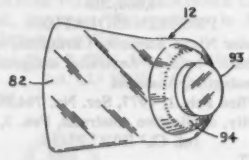
DISPENSING HEAD ASSEMBLY FOR FLUID DISPENSING SYSTEM AND A NOZZLE THEREFOR MADE OF PLASTIC MATERIAL

Richard C. Dreibelbis, Fair Lawn, and Warren E. Turner, Succasunna, both of N.J., assignors to Emerson Electric Co. (H&H Thermostats Div.), Cedar Grove, N.J.

Division of Ser. No. 588,049, June 18, 1975, and a continuation-in-part of Ser. No. 536,177, Dec. 24, 1974, abandoned. This application June 2, 1976, Ser. No. 692,105

Int. Cl.² E03B *9/20*

U.S. Cl. 239—24 9 Claims



1. In a dispensing nozzle assembly for the dispensing head on a fluid dispensing system,

a. said dispensing head having a longitudinally extending bore with a predetermined diameter to define the inner wall of an outlet in said dispensing head,

b. nozzle means press fitted into the outlet formed in said dispensing head,

c. said nozzle means made of plastic material and having a fluid flow passage therethrough having an inlet at one end for the fluid to be dispensed and an outlet formed at the opposite end,

d. at least one portion of the outer diameter of said nozzle means adapted to form a friction fit with the inner wall of the outlet when said nozzle means is press fitted into assembled position in said dispensing head,

e. a plurality of circumferentially spaced shoulders disposed on the inner wall of the outlet for operative engagement with the inlet end of the nozzle means to limit the depth the nozzle means is press fitted into the outlet in said dispensing head, and

f. means to provide a fluid tight seal between the nozzle means and the inner wall of the outlet in said dispensing head.

4,060,199

ELECTROMAGNETIC FUEL INJECTION VALVE

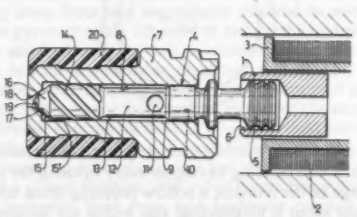
Gerhard Brune, and Waldemar Hans, both of Bamberg, Germany, assignors to Robert Bosch G.m.b.H., Stuttgart, Germany

Filed Sept. 29, 1976, Ser. No. 727,701

Claims priority, application Germany, Oct. 1, 1975, 2543805

Int. Cl.² F16K *31/06*; B05B *1/34*

U.S. Cl. 239—488 4 Claims



1. In an electromagnetic fuel injection valve which includes a casing, a magnetic coil, a stationary iron core within said coil and a movable armature moving axially with said core within said casing and provided with a valve closing needle guided by portions of said casing for cooperation with an injection orifice obturated by said valve needle, the improvement comprising:

said valve needle is provided with a plurality of curved channels for carrying fuel and for imparting turbulence thereto; and

said casing and said valve needle together define a pressure chamber whose maximum volume is no greater than the volume of fuel from said valve during a single stroke.

4,060,200

DRIP LEVEL IRRIGATION

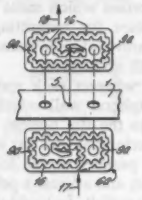
Raphael Mehoudar, Tel-Aviv, Israel, assignor to Hydro-Plan Engineering Ltd., Tel-Aviv, Israel

Filed Aug. 14, 1975, Ser. No. 604,838

Claims priority, application Israel, Aug. 14, 1974, 45466

Int. Cl.² B05B *15/00*

U.S. Cl. 239—542 8 Claims



1. An emitter unit comprising a pair of casing components, each having a surface, and oriented so that the surfaces face each other, coupling means for coupling said components together via a unitary strip that has continuous opposite surfaces, the strip being interposed between the components such that the surfaces thereof respectively engage the opposite surfaces of the strip which extends beyond the components to form a closed conduit within which fluid can flow, means on the surface of at least one component coacting with the surface of the strip engaged therewith for defining a flow restricting flowpath within which fluid flows in contact with both surfaces, and communicating means for effecting communication between said flowpath and the other component via said strip.

4,060,201

SPRINKLER HEAD

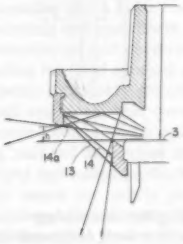
Tomiichi Tomita, Tokyo, Japan, assignor to Sanwa Seiki Kabushiki Kaisha, Tokyo, Japan

Filed Mar. 26, 1976, Ser. No. 670,685

Claims priority, application Japan, Mar. 28, 1975, 50-36811

Int. Cl.² A62C *37/10*

U.S. Cl. 239—553 5 Claims



1. An improved sprinkler head, comprising:

a funnel-shaped housing member provided at its upper end with an annular internally threaded flange, and at its lower end with a central bore which is substantially aligned with the longitudinal axis of the funnel-shaped housing member, said housing member also including a conical wall

which slants inwardly and downwardly as it extends between the annular flange and said central bore, said conical wall having a plurality of sprinkling apertures extending therethrough;

a threaded disc-shaped cover threadably engaged within the annular flange, said cover having a pipe portion fixed centrally thereto and projecting upwardly therefrom, said cover having a substantially flat bottom surface which extends substantially perpendicular to said longitudinal axis and is spaced upwardly above the interior surface of said conical wall;

a deflector mounted on said housing member and positioned below said cover, said deflector having an upper platelike portion normally maintained in sealed engagement with said cover in surrounding relationship to the discharge end of said pipe portion;

means coacting between said housing member and said deflector for normally maintaining said platelike portion in sealed engagement with said cover, said means including a fusable portion which melts in response to a preselected temperature for permitting the deflector to be moved downwardly into a lowered position out of sealed engagement with said cover;

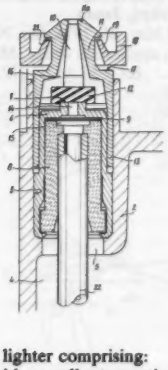
the improvement wherein each sprinkling aperture is defined by a peripheral wall which extends substantially perpendicular to the flat bottom surface of said cover, whereby said peripheral wall has an axial direction which is substantially parallel to the longitudinal axis of said housing member, and at least a portion of said peripheral wall as disposed radially outermost from said longitudinal axis being positioned at an elevation between the bottom surface of said cover and the upper surface of said platelike portion when the latter is in said lowered position, whereby at least part of the liquid supplied through said pipe portion impinges against the upper surface of said deflector and is deflected radially outwardly and impinges against the outer portion of said peripheral wall.

4,060,202

VALVE FOR GAS LIGHTER

Guy Neyret, Francheville, France, assignor to Societe Anonyme dite: Etablissement Genoud & Cie, Venissieux, France

Filed June 4, 1976, Ser. No. 692,730
Claims priority, application France, June 5, 1975, 75.18162
Int. Cl.[2] F23D *13/04*
U.S. Cl. 239—579 **10 Claims**



1. A valve for a gas lighter comprising:

a housing formed with a well communicating with a fuel reservoir;

an axially elongated tubular valve member received in said well and having one end anchored therein and another end formed with a valve seat surrounding an orifice;

a tubular filter-support member received in said valve member and coaxial therewith;

a pressure-regulating filter clamped between said members for regulating the flow of gaseous fuel through said orifice;

an elongated burner member formed at one end with a burner nozzle and a passage communicating between said orifice and said nozzle, and at its opposite end with an elongated cylindrical skirt slidingly engaging the exterior of said valve member; and

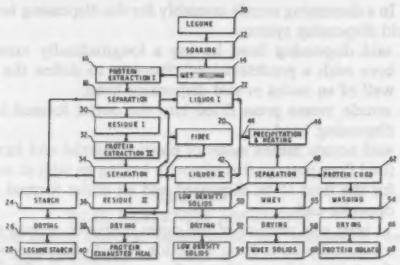
a valve body on said burner-member engageable with said seat for blocking flow from said orifice to said passage, said passage extending only over a portion of the length of said burner-member.

4,060,203

PROTEIN ISOLATION

Ronald Alexander Nixon Edwards, Caringbah, and Jorge Manrique, Newcastle, both of Australia, assignors to Unisearch Limited, Kensington, Australia

Filed Feb. 1, 1977, Ser. No. 764,509
Claims priority, application Australia, Feb. 3, 1976, 4714/76
Int. Cl.[2] B02C *23/36*
U.S. Cl. 241—7 **8 Claims**



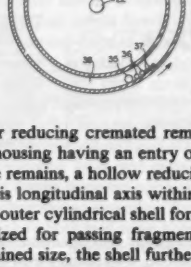
1. In a process for the extraction of protein from low fat seeds, the improvement comprising soaking the seeds in an aqueous medium until the seed are saturated with water and wet milling the seeds prior to extracting the protein from the seeds.

4,060,204

CREMATED REMAINS PROCESSOR

Danny Franklin Williford, Miami, Fla., assignor to No Flame Process, Inc., Miami, Fla.

Filed Oct. 22, 1976, Ser. No. 734,985
Int. Cl.[2] B02C *17/02*
U.S. Cl. 241—74 **8 Claims**



1. Apparatus for reducing cremated remains including the combination of a housing having an entry opening for receiving a charge of the remains, a hollow reducing drum mounted for rotation about is longitudinal axis within the housing, said drum including an outer cylindrical shell formed with a plurality of apertures sized for passing fragments of the remains below a predetermined size, the shell further including an end opening positioned in register with the entry opening of the housing for receiving the charge of remains, means for rotating

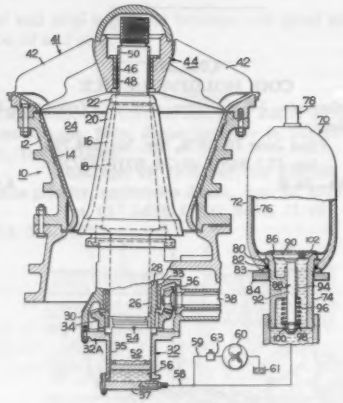
the drum about its longitudinal axis, a plurality of elongate rods carried within the drum, at least certain of the rods having disparate diameters, means for constraining the rods for relative movement about the inner periphery of the drum whereby the rods are caused to react with the rotating shell of the drum and tumble one over the other for progressively reducing the remains to a size for passing through the apertures, and means for collecting the remains which pass through the apertures.

4,060,205

HYDRAULIC ACCUMULATOR FOR USE WITH GYRATORY CRUSHERS AND COMBINATION OF SUCH ACCUMULATOR WITH A GYRATORY CRUSHER

Robert J. Pollak, Appleton, Wis., assignor to Allis-Chalmers Corporation, Milwaukee, Wis.

Filed Nov. 8, 1976, Ser. No. 740,114
Int. Cl.² B02C 2/06
U.S. Cl. 241—211 **9 Claims**



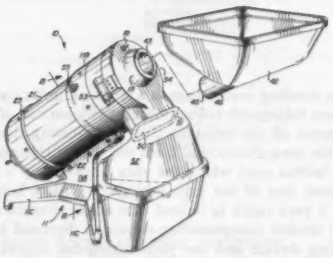
1. In combination, a gyratory crusher, said crusher comprising a crusher head and a shaft-like member in supporting relation to said crusher head, means forming part of the crusher structure and defining a crusher hydraulic chamber for receiving a hydraulic fluid which is in supporting relation to said shaft-like member and to said crusher head, a hydraulic accumulator located in spaced relation to said crusher, a hydraulic conduit fluidly connecting said crusher hydraulic chamber and said hydraulic accumulator, said hydraulic accumulator comprising a hollow accumulator chamber for receiving hydraulic fluid from said crusher hydraulic chamber whereby to permit lowering of said shaft-like member and said crusher head when said crusher encounters uncrushable material, said crusher head during the period when it is attempting to pass uncrushable matter through the crusher moving toward the uncrushable material on one part of each gyratory cycle whereby to increase the hydraulic pressure in said hydraulic conduit and moving away from said uncrushable material on another part of each gyratory cycle whereby to reduce the hydraulic pressure in said hydraulic conduit, an elastic bladder member positioned in said accumulator chamber, said bladder member containing a precharge of a gas at a predetermined precharge pressure, valve means incorporated as part of the accumulator structure for controlling flow of hydraulic fluid between said hydraulic conduit and said accumulator chamber,. spring means engaging said valve means and biasing said valve means toward a closed position, said valve means being openable to admit hydraulic fluid from said hydraulic conduit into the interior of said accumulator chamber during said one part of the gyratory cycle in which said crusher head is moving toward said uncrushable material, said spring means being adapted to close said valve means to prevent any significant reverse hydraulic flow from said accumulator chamber into said hydraulic conduit during said another part of the gyratory cycle when said crusher head is moving away from said uncrushable material, whereby to prevent "water hammer" in said hydraulic conduit, and bleed passage means fluidly communicating the interior of said accumulator chamber with said hydraulic conduit, said bleed passage means being effective to permit a restricted reverse flow of hydraulic fluid from said accumulator chamber into said hydraulic conduit and thus to said crusher hydraulic chamber with said valve means in closed position whereby to cause a gradual upward movement of said shaft-like member and said crusher head after the uncrushable material has passed through said crusher.

4,060,206

GRINDING MILL

Clarence E. Granzow, 2516 E. Jackson St., Phoenix, Ariz. 85034

Filed Oct. 8, 1976, Ser. No. 730,804
Int. Cl.² B02C 5/08
U.S. Cl. 241—259.1 **6 Claims**



1. A grinding mill for seeds, nuts, grains and like materials comprising in combination:

a frame having a base portion and a cover portion,

said cover portion having a pivotally mounted cover for exposing and concealing the inside of said cover portion,

motor means comprising a rotating shaft mounted on said base portion of said frame,

a milling head comprising a pair of relatively movable disc type cutting and grinding members juxtapositioned in coplanar arrangement when in a grinding and milling operation within said cover portion,

one of said members being mounted on said shaft for rotation therewith and the other of said members being mounted on said cover for pivotal movement therewith from a position juxtapositioned to said one member to a position spaced therefrom for exposing said one member,

said cover being provided with an aperture extending therethrough for alignment with an aperture extending through said other member into a space between said members,

a collar surrounding said aperture in said cover,

a hopper mountable on said cover and having a discharge passage leading into said aperture of said cover, and

said hopper being detachably mounted on said collar surrounding said aperture in said cover,

said cover portion comprising a milling chamber housing said milling head and defining an outlet port for discharging the ground and milled products, and

an adjustment means for axially positioning one of said grinding members relative to the other for controlling the condition of the milled product,

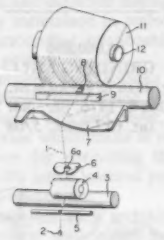
said adjustment means comprises a cam rotatably mounted on said cover,

said frame supporting said motor and rotating shaft at an acute angle with a supporting surface of the grinding mill with the longitudinal axis of said outlet port of said milling chamber being substantially perpendicular to the axis of said rotating shaft.

4,060,207
YARN WINDING MECHANISM IN SPINNING MACHINE

Tsutomu Miyazaki, Kariya; Yoshiaki Yoshida, Ohbu; Shozo Ueda, Kariya; Kinpei Mitsuya, Aichi, and Takeshi Ogasawara, Gamagori, all of Japan, assignors to Kabushiki Kaisha Toyoda Jidoshokki Seisakusho, Kariya, Japan

Filed Feb. 7, 1977, Ser. No. 766,507
Claims priority, application Japan, Feb. 10, 1976, 51-12806
Int. Cl.² B65H *54/02*
U.S. Cl. 242—18 R 4 Claims

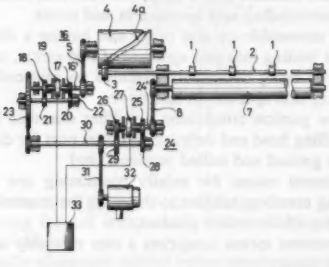


1. A yarn winding mechanism in a spinning unit comprising a pair of yarn taking-out rollers taking the yarn out of a yarn discharge point of the spinning unit, a traversing device for traversing the yarn discharged from the yarn discharge point, and a cone bobbin onto which the yarn is traversely wound in a cone cheese, one of the yarn taking-out rollers being provided with a yarn catch in its end face edge, characterized in that a yarn tension compensating device is disposed between the traversing device and the yarn taking-out rollers with a yarn guide surface so contoured as to compensate changes in yarn tension due to the traverse and cone winding of the yarn, a portion of the yarn guide surface of the compensating device on the larger diameter side of the cone bobbin being so shaped and positioned that the yarn following a path adjacent to one of endmost paths between which the yarn traverses on the yarn discharge point is caused to be caught by the yarn catch of the yarn taking-out roller on the larger diameter side of the cone bobbin.

4,060,208
METHOD AND DEVICE FOR IRREGULARIZING OR DISTURBING A WINDING PATTERN IN A WINDING APPARATUS FOR CROSS-WOUND COILS

Hans Raasch, Munchen-Gladbach, Germany, assignor to W. Schlafhorst & Co., Munchen-Gladbach, Germany

Filed July 30, 1976, Ser. No. 710,315
Claims priority, application Germany, July 31, 1975, 2534239
Int. Cl.² B65H *54/38*
U.S. Cl. 242—18.1 3 Claims

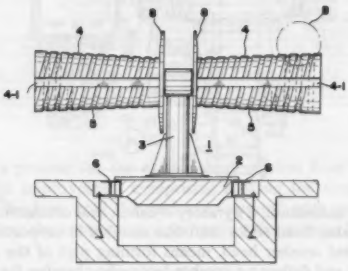


1. In apparatus for winding cross-wound coils with a constant thread feeding velocity having a reciprocating thread guide, means for reciprocating the thread guide and means for driving the reciprocating means for time intervals alternatingly with at least two different speeds, a device for irregularizing or disturbing the winding pattern in the apparatus comprising separate means for driving the thread guide and for winding the cross-wound coil, means for controlling both said thread guide driving means and said cross-wound coil winding means in dependence upon one another, so that the quotient of the peripheral speed of the cross-wound coil and the cosine of half the thread crossing angle is constant, both said driving means and said winding means being each selectively switchable from one to another speed of rotation differing by approximately 10% from one another in accordance with a parameter of switching selections that includes rhythmic switching and random switching at predetermined time intervals, and gear transmission systems including respective shifting clutches operatively connected to each of said thread-guide driving means and said cross-wound coil winding means, and timing control means for controlling shifting of said shifting clutches.

4,060,209
COIL HOLDING DEVICE

Kotaro Tsukamoto, 7-8 Kashima, 4-Block, Yodogawa, Osaka, Osaka, Japan

Filed June 10, 1976, Ser. No. 694,798
Int. Cl.² B65H *49/26*; B21C *47/20*
U.S. Cl. 242—54 R 4 Claims



1. A coil holding device comprising:
a bed plate;
an upright support on said bed plate; and
a pair of rotary drum means mounted on said upright support above said bed plate for rotatably holding two of said coils thereon, each drum means having a spiral groove around the circumference thereof, said spiral being inverse to the rotary direction of said drum means, whereby said spiral groove moves toward said support as said rotary drum means rotates.

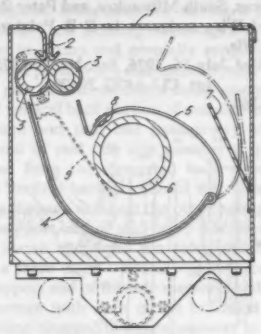
4,060,210
TAKE-UP SPOOLS

John Henry Norris, Beaconsfield, England, assignor to Linotype-Paul Limited, England

Filed June 14, 1976, Ser. No. 695,812
Claims priority, application United Kingdom, Feb. 13, 1976, 5844/76
Int. Cl.² G03B *1/04*
U.S. Cl. 242—71.1 14 Claims

1. A mechanism for automatically taking up strip material to be wound on a spool, comprising a take-up spool, a fixed rigid guide member arranged, in use, to guide said strip material to and around said spool, and a pivotally mounted guide member

arranged, in use, to guide said strip material from said fixed guide member around said take-up spool such that the leading



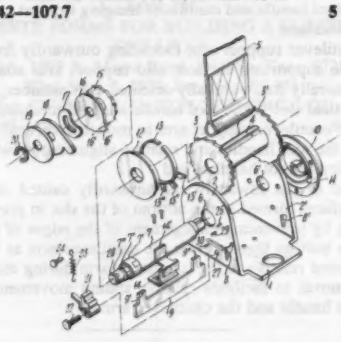
end of said strip is gripped between said spool and a remote portion of said strip.

4,060,211

RETRACTION LOCKING SAFETY BELT RETRACTOR

Juichiro Takada, Shin, Japan, assignor to Takata Kojyo Co., Ltd., Tokyo, Japan

Filed Apr. 19, 1976, Ser. No. 678,510
Claims priority, application Japan, Apr. 22, 1975, 50-048212
Int. Cl.² A62B *35/00*; B65H *75/48*
U.S. Cl. 242—107.7 **5 Claims**



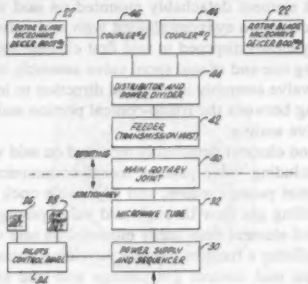
1. A belt retractor device comprising a U-shaped mounting bracket, a shaft rotatably supported by said bracket, a reel mounted on said shaft and rotatable therewith in opposite belt retraction and extraction directions, a belt coupled to said reel and windable thereon with the belt retraction rotation thereof, spring means biasing said reel and shaft in a belt retraction direction, first braking means for braking said reel against rotation in a belt retraction direction and transferrable between braking and release positions and actuating means responsive to the successive extraction and retraction rotation of said reel for alternatively positioning said first braking means in said braking or release positions, said device being characterized in that said first braking and actuating means comprise a ratchet wheel rotatable with said shaft, a pawl pivotally mounted on said bracket and movable between ratchet wheel engage and disengage positions to respectively brake and release said reel, spring means urging said pawl toward a ratchet wheel engage position, a first driven member slip drive coupled to said reel and rotatable a predetermined angle and having a lock portion adapted to releasably lock said pawl in its ratchet wheel disengage position, a second driven member slip coupled to said reel and rotatable a predetermined angle to swing said pawl toward said first drive member with the belt extraction rotation of said reel, a drive disc coaxially affixed to said shaft, said first and second driven members comprising disc members coaxially located on said shaft and rotatable relative thereto between said ratchet wheel and said drive disc and spring means urging each of said driven disc members into frictional drive engagement with said drive disc and ratchet wheel respectively.

4,060,212

DEICING APPARATUS AND METHOD

Bertram Magenheim, Bethesda, Md., assignor to System Development Corporation, Santa Monica, Calif.

Filed Apr. 1, 1976, Ser. No. 672,613
Int. Cl.² B64D *15/12*
U.S. Cl. 244—134 D **10 Claims**



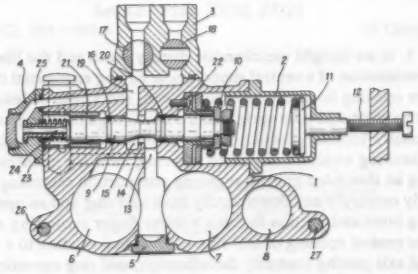
1. Aircraft deicing apparatus, comprising:
means for generating microwave electromagnetic energy;
distribution means for transmitting the microwave energy to a surface to be deiced; and
coupling means, for coupling the microwave energy from said distribution means to a surface layer of ice, said coupling means being configured to transmit the microwave energy through the ice layer in the manner of a surface waveguide, whereby substantially all of the energy is dissipated as heat primarily in the ice layer, thereby raising the temperature of the ice layer sufficiently to effect removal of the ice layer from the aircraft.

4,060,213

PRESSURE CONTROL DEVICE

Jean H. Hasquenoph, Lagny-sur-Marne, and Pierre Fernand Coutin, Paris, both of France, assignors to R. Alkan & Cie, Valenton, France

Filed July 1, 1976, Ser. No. 701,707
Claims priority, application France, July 2, 1975, 75.20712
Int. Cl.² B64D *1/02*
U.S. Cl. 244—137 R **4 Claims**



1. A pressure control device comprising:

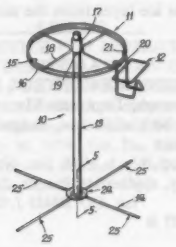
i. a valve body including:
   a. a valve chamber including a first chamber portion, a second chamber portion spaced axially from said first chamber portion, and an annular valve seating between said first and second chamber portions
   b. cavities for receiving sources of gas under pressure
   c. inlet passage means leading from said cavities to said first chamber portion
   d. outlet passage means leading from said second chamber portion to outlet ports
   e. a control gas passage communicating with said outlet passage means
ii. a spool valve assembly axially movable in said valve chamber and having a frusto-conical portion adapted to coact with said annular valve seating
iii. a first element detachably mounted on said valve body and including a cylinder aligned with said valve chamber
iv. spring means disposed in said first element cylinder and abutting one end of said spool valve assembly to urge said spool valve assembly in the axial direction to increase the opening between the frusto-conical portion and the annular valve seating
v. a second element detachably mounted on said valve body and including valve passage means communicating with the outlet passage means, and adjustable cock means for controlling gas flow through said valve passage means
vi. A third element detachably mounted on said valve body and defining a transfer passage providing communication between said control gas passage and said spool valve assembly such that gas pressure in said control gas passage acts to urge the spool valve assembly axially against the action of said spring means.

4,060,214

MERCHANDISE DISPLAY STAND

Derek N. G. Metcalf, La Grange Park, Ill., assignor to Athena Industries, Inc., La Grange, Ill.

Filed Nov. 15, 1976, Ser. No. 741,965
Int. Cl.² F16M *11/32*
U.S. Cl. 248—165 **7 Claims**



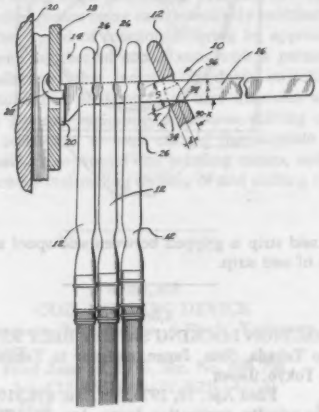
1. In an upright merchandise display stand and the like, the combination of a central support pole having an internal chamber opening inwardly of its lower end, and a base pedestal for supporting said pole upright and comprising a base ring, operationally located centrally beneath the pole's lower end, and plural leg members affixed to said ring; each leg member having an elongated ground engaging arm portion extending radially ouwardly and downwardly from said ring and an upstanding inner end portion forming a linear finger projecting above the central opening of said ring in diverging relation to a vertical axis passing centrally therethrough; said ring operationally moving under vertical load simultaneously to converge said finers for insertion into said chamber whereby to frictionally interconnect said pole and pedestal.

4,060,215

SLOTTED TOOL HANDLE

Fredrick B. Burns, South Milwaukee, and Peter Balint, Wauwatosa, both of Wis., assignors to E Z Painter Corporation, Milwaukee, Wis.

Filed July 16, 1976, Ser. No. 706,075
Int. Cl.² A47G *29/00*
U.S. Cl. 248—360 **9 Claims**



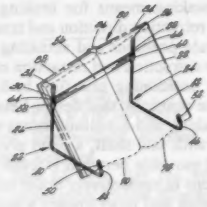
6. A tool handle and cantilever hanging support comprising, in combination:
   a cantilever support arm extending outwardly from a suitable supporting surface, said support arm comprising a generally flat, vertically oriented arm member;
   a vertical slot in the tool handle adapted to slidably engage the cantilever support arm to maintain vertical alignment of the tool handles and relative alignment between a plurality of tool handles; and
   a pair of flat inwardly and upwardly canted converging surfaces formed at the bottom of the slot to prevent binding by preventing engagement of the edges of the slot at the bottom thereof with the cantilever arm as the tool is canted relative to the cantilever arm during mounting or removal to facilitate relative sliding movement between the handle and the cantilever arm.

4,060,216

ADJUSTABLE READING MATERIAL SUPPORTER

Theodore L. Million, 793 Cambridge Drive, Santa Barbara, Calif. 93111

Continuation of Ser. No. 628,483, Nov. 4, 1975, abandoned. This application Jan. 17, 1977, Ser. No. 760,003
Int. Cl.² E01B *7/10*
U.S. Cl. 248—460 **10 Claims**



1. An adjustable reading material supporter comprising
   a pair of unitary side members, each side member including an extended vertical back portion terminating in an aligned support end and a substantially horizontal base portion terminating in a deflector guide end inclined in a

spaced upward and rearward direction relative to said back portion; and

a rigid elongated back structure having a pair of spaced aligned ends each defining a passageway of a selected dimension to clamp and pivotally support the extended vertical back portion of a side member, said back structure and said pair of side members being assembled with the extended vertical back portion of one side member extending through and past one passageway to position the support end of said one side member a spaced distance above and from the elongated back structure and the extended vertical back portion of the other side member extending through and past the other passageway to position the support end of said other side member a spaced distance above and from the elongated back structure forming a three point vertical support comprising each spaced support end of the side members and the elongated back structure with each of the extended vertical back portion being clamped in the passageway in a substantially planar parallel spaced relationship, and with each of the base portions of the side members being located on and equidistant from the same side of the back structure enabling each side member to be independently rotatable 360° within its fixed clamping pivotal support to form an integral structure adapted to support reading material positioned between the support end, back structure and deflector guide ends, said guide ends being capable of being adjusted relative to the reading material by rotation of the side members.

4,060,217

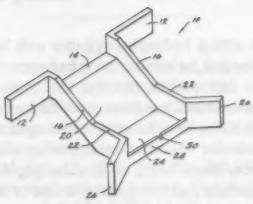
CONCRETE FORMS FOR BUILDING A CONCRETE SPILLWAY

Donald Kirk, 1903 N. Maize Road, Wichita, Kans. 67212

Filed Sept. 2, 1975, Ser. No. 609,671

Int. Cl.² B28B *7/22;* **F02B** *5/08;* **F04C** *1/00*

U.S. Cl. 249—10 **6 Claims**



1. A concrete form for use in pouring concrete structures on a ground surface, the concrete form comprising:

form plates adjacent to one another for receiving the concrete therebetween and forming a desired structure, said form plates having outwardly extending flange portions on the top and bottom of said plates and angular shaped keepers mounted on the outer side of said form plates, the top flange portions having apertures therein;

a "U" shaped yoke having a rigid unitary structure and an angular cross-section, said yoke including;

a top portion;

two downwardly extending parallel arms attached at one end to the ends of the top portion, the other ends of the two arms removably inserted into the apertures in the top flange portion of said form plates and therethrough, the other ends of the two arms received in the keepers of said form plates;

"L" shaped brackets extending outwardly from the sides of the arms and having apertures therein for receiving securing means therethrough for securing the arms to the top flange portions of said form plates;

an angular shaped crossbar disposed below and parallel to the top portion of said yoke, the ends of the crossbar attached to the arms of said yoke, the crossbar resting on the top flange portion of said form plates when said yoke is slidably received in said form plates; and

anchor arms and anchor pins, said anchor arms having one end attached to the bottom flange portion of said form plates, the other end of said anchor arms attached to said anchor pins, said anchor pins driven into the ground surface.

4,060,218

PNEUMATICALLY CONTROLLED RIGID CORE-FORMER

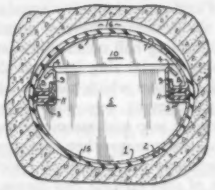
Kandiah Tharma Nayagam, No. 6B 2nd Floor, Lorong Medan Tuanku Satu, Kuala Lumpur, Malaysia

Filed June 14, 1976, Ser. No. 696,125

Claims priority, application United Kingdom, June 26, 1975, 27090/75

Int. Cl.² B28B *7/32*

U.S. Cl. 249—65 **5 Claims**



1. A form assembly for use in forming a core portion of a structure, comprising:

a pair of former elements each having an exterior forming surface, said former elements being adapted to fit together and being relatively movable between a first collapsed position and a second expanded position wherein said former elements interfit with one another with their forming surfaces cooperating to present a surface for shaping the core;

a resilient sleeve member closely fitting on said former elements in substantially surrounding relation thereto;

a hook member on one of said former elements;

a hook engaging member on the other of said former elements adapted to engagingly interlock with said hook member in the expanded position and separated from said hook member in the collapsed position; and

means located between said former elements for effecting relative movement thereof from said collapsed to said expanded position.

4,060,219

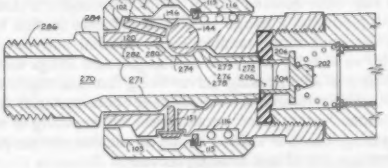
QUICK DISCONNECT COUPLER AND SAFETY CHECK VALVE

Charles S. Crawford, 405 S. LaJolla Ave., Tucson, Ariz. 85711

Filed June 4, 1975, Ser. No. 583,573

Int. Cl.² F16L *29/00, 37/28*

U.S. Cl. 251—149.6 **10 Claims**



1. In a compressed air system in-line quick disconnect female coupler adapted to receive an associated cylindrical male plug having a truncated cone cross-sectional shaped annular ring

formed thereon and an annular groove formed therein, said annular ring defining in part said annular groove an improvement comprising cylindrical body means having at least one each angled first passageway through the cylindrical wall thereof; retractable sleeve means exteriorly coaxial said cylindrical body means, said sleeve means defining a first interior annular groove means juxtaposed said first passageway in said cylindrical body means, annular split ring means nesting in said first annular groove means, compression spring means interior said sleeve means juxtaposed said annular split ring means and said cylindrical body means outside surface, and second interior annular groove means adjacent said first interior annular groove means; holding ball means residing in said cylindrical body means first passageway communicating with both said cylindrical body means interior and exterior; and full flow valve means interiorly said cylindrical body means whereby when inserting said associated male plug means into said female coupler, said holding ball means is engaged by the associated male plug means annular ring, said holding ball rises in said first passageway, engages said sleeve means split ring means and wall of said second interior annular groove means, and retracts said sleeve means thereby permitting continued movement of said holding ball means in order to ride up said associated male plug annular ring into said sleeve means second interior annular groove which has moved over said cylindrical body first passageway, over said associated male plug annular ring and down into said associated male plug annular groove means, said spring means then urging said sleeve means to its initial position and the associated male plug is held in place by coaction of said holding ball means, said associated male plug annular groove means, and said sleeve means, and said cylindrical body means thereby engaging said full flow valve means permits air to flow through said coupler.

4,060,220

VALVE

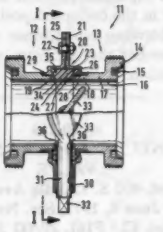
Josef Fischer, Underkochen, Germany, assignor to Firma Neumo Armaturenfabrik-Apparatebau-Metallgiesserei GmbH, Germany

Filed Apr. 7, 1976, Ser. No. 674,332

Claims priority, application Germany, Apr. 11, 1975, 7511424[U]

Int. Cl.² F16K *1/22*

U.S. Cl. 251—306 **8 Claims**



1. A valve, comprising:

a valve housing comprising two valve housing halves, each of said valve housing halves being comprised of a connection piece and a flange section, said flange section being constructed from stamped sheet material and provided with an annular area forming flanges, said flange sections of each of said housing halves being fastened together by detachable fasteners, each of said sheet material flange sections having a connection area surrounding a valve opening which is welded to one of said connection pieces forming one of said housing halves;

each sheet material flange section being provided with at least one semi-circular recess to form a shaft guide recess for a valve shaft, located in the separation plane between the flange sections, that runs transversely to the valve opening, said valve shaft being provided with a valve flap that swivels with the valve shaft; and

an integral valve sealing ring penetrated by the valve shaft for sealing off the valve shaft and forming a valve seat for said valve flap, said valve sealing ring being mounted in an undercut recess of the valve housing that encircles the valve opening and is partially retained by said flange sections.

4,060,221

DOUBLE-ACTING HYDRAULIC CYLINDER HAVING TWO PISTONS ARRANGED FOR COAXIAL MOVEMENT RELATIVE THERETO

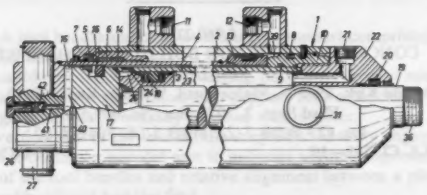
Ulf Christer Rilbe, Hudiksvall, Sweden, assignor to Hiab-Foco Aktiebolag, Hudiksvall, Sweden

Filed Jan. 27, 1977, Ser. No. 762,836

Claims priority, application Sweden, Feb. 3, 1976, 7601122

Int. Cl.² F01B *7/20*

U.S. Cl. 254—93 R **1 Claim**



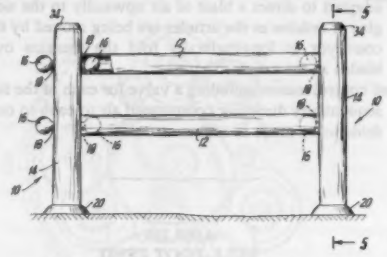
1. A double acting hydraulic cylinder unit having two concentrically arranged jackets forming between them an annular chamber, inlet and outlet ports for the admission and withdrawal of a pressurized medium provided at the ends of the annular chamber, an annular piston arranged for axial movement in said annular chamber, said annular chamber having a first end section, there being an annular gap formed between said first end section and the innermost one of said jackets, said annular piston having a tubular piston rod arranged for axial displacement in said annular gap, and a second piston arranged for axial displacement inside of said innermost jacket, the improvement comprising a bottom section in the innermost jacket, means forming an inlet and outlet port for said pressurized medium at the opposite end of said innermost jacket, there being aperture means provided near and inwardly of said bottom section of the innermost jacket and through the side wall thereof, there being first and second end spaces in said annular chamber and in the innermost jacket which communicate through said aperture means, said first end space of said annular chamber being between said annular piston and an adjacent end section of the outermost of said jackets and the second end space disposed between said bottom section of the innermost jacket and said second piston, there being another annular gap between said annular piston and said innermost jacket, the last-named annular gap communicating with said aperture means, a seal disposed between said tubular piston rod and said bottom section of said innermost jacket, said bottom section closing one end of said innermost jacket and defining one end wall of a space at the outer end of said tubular piston rod, an end closure piece on the tubular piston rod defining an opposing wall of said space, and said space having communication with the atmosphere.

4,060,222

PREFABRICATED FENCING SYSTEM

Sheldon Pitkin, 17 Verdin Drive, New City, N.Y. 10956; Richard Varcadipane, R.D. 3 - Box 542-D, Sussex, N.J. 07461, and Walter H. Poppe, 7 Alexander Ave., Waldwick, N.J. 07463

Filed June 22, 1976, Ser. No. 698,504
Int. Cl.[2] B21F *27/00*
U.S. Cl. 256—50 15 Claims



1. A plurality of unassembled prefabricated fence components for on site ground assembly which comprises:

a plurality of uprightable posts, each having a plurality of connection members projecting radially therefrom in at least two opposite directions,

each of said posts having an opening passing axially therethrough for receiving a rod for mounting said post in the ground,

a plurality of rails for horizontal disposition between said posts,

said rails having end openings axially aligned with said rails dimensioned to engage said connection members, whereby said rails can be supported at their ends by said connection members, and

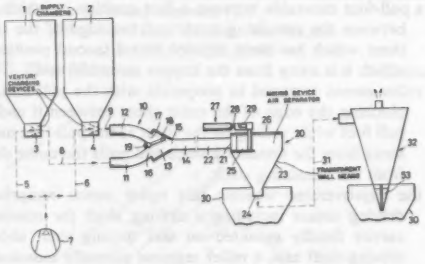
a plurality of rods for axial insertion through each of the axial openings of each of said posts so that said rods project from said posts for mounting and positioning said posts in the ground.

4,060,223

DEVICE FOR MIXING GRANULAR AND/OR PULVEROUS SUBSTANCES

Paul Bongartz, Isny-Kleinhaslach, and Franz Haag, Isny, both of Germany, assignors to Motan Gesellschaft mit beschrankter Haftung, Isny, Germany

Filed Aug. 17, 1976, Ser. No. 715,046
Claims priority, application Germany, Oct. 4, 1975, 2544441
Int. Cl.[2] B01F *15/00*
U.S. Cl. 366—179 20 Claims



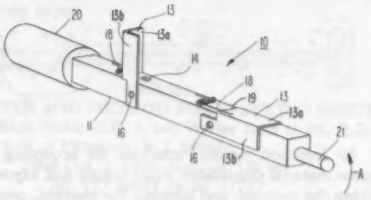
1. In a device for mixing flowable materials, especially dry materials, comprising; at least a pair of supply conduits each adapted to convey a respective material, a discharge conduit, a fitting connected to the downstream ends of said supply conduits and to the upstream end of said discharge conduit, valve means selectively operable for closing off either one of the discharge ends of said supply conduits, and means for supplying materials to the supply conduits under control of the valve means positioned alternately to block and to permit discharge of material from the respective conduit.

4,060,224

MIXING BAR AND SYSTEM

William Wilson, 716 Scott St., Stroudsburg, Pa. 18360

Filed Mar. 8, 1976, Ser. No. 664,718
Int. Cl.[2] B01F *7/00, 15/02*
U.S. Cl. 366—169 7 Claims



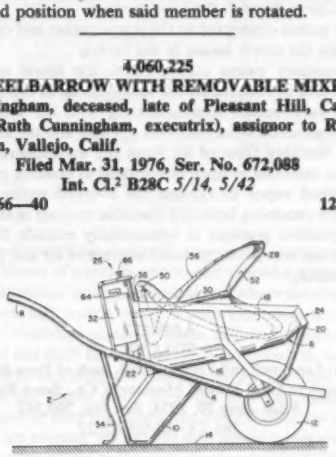
1. A mixing bar comprising a hollow elongated member which is rotatable about its axis, means for coupling the interior of said bar to a supply of fluid, at least one aperture in said member for permitting said fluid to be discharged from said member, at least one blade, means for pivotally connecting said blade to said elongated member so that it can pivot between a first position in which it covers said aperture and a second position in which said aperture is uncovered and fluid is discharged from said aperture, and said blade is moved toward said second position when said member is rotated.

4,060,225

WHEELBARROW WITH REMOVABLE MIXER

Art Cunningham, deceased, late of Pleasant Hill, Calif. (by Velma Ruth Cunningham, executrix), assignor to Roger E. Bergman, Vallejo, Calif.

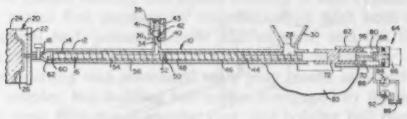
Filed Mar. 31, 1976, Ser. No. 672,088
Int. Cl.[2] B28C *5/14, 5/42*
U.S. Cl. 366—40 12 Claims



1. Apparatus for mixing and transporting a cementitious slurry comprising in combination: a container including upwardly inclined sidewalls for receiving slurry materials including water and means mounting the container for movement over a support surface; a mixing unit including a mixing blade being at least partially disposed in the container and drive means including a shaft for rotating the blade; and means for removably mounting the mixing unit to and supporting the unit on an end wall of the container so that slurry materials in the container are intimately mixed by the blade when the drive means is actuated, the mounting means including a mounting plate to which the drive means is secured and through which the shaft extends, the plate including a U-shaped upper end defining a downwardly opening channel for engaging an upper

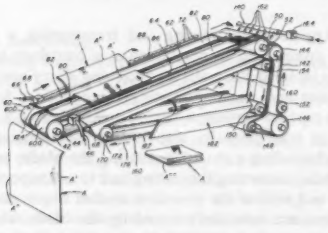
edge of the end wall during the mixing operation; whereby the slurry can be mixed in the container by temporarily positioning the mixing unit thereon and thereafter removing it for movement of the mixed slurry in the container to a point of use.

4,060,226
APPARATUS FOR INJECTION MOLDING
John Schweller, 3075 Plainfield Road, Dayton, Ohio 45432
Filed July 8, 1976, Ser. No. 703,424
Int. Cl.[2] B29B *1/10*
U.S. Cl. 366—75 **5 Claims**



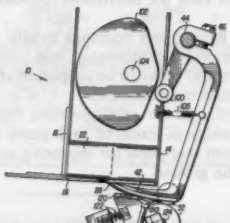
1. An injection molding machine for accepting synthetic resinous material degradable when heated and exposed to air, working the material, and forming the material, comprising:
- a barrel having a material discharge opening, a screw receiving bore communicating with the discharge opening, a feed opening communicating with the screw receiving bore and a vent opening communicating with the screw receiving bore intermediate the feed opening and the discharge opening;
- screw means mounted in the screw receiving bore, having a first stage upstream of said vent opening and a second stage communicating with the vent opening so that vapor evolved from the material leaving the first stage will discharge through the vent opening;
- rotary means connected to the screw means and operable to rotate the screw means in the barrel;
- reciprocatory means connected to the screw means and operable to reciprocate the screw means in the barrel; and
- check valve means communicating with the vent opening interposed between said vent opening and the atmosphere for blocking flow of air from the atmosphere into said vent, operable to open in response to positive pressure of evolved vapor to exhaust the evolved vapor from the screw receiving bore and operable to close in the absence of positive pressure to substantially exclude flow of air into the bore, so as to avoid contact of air and plasticated material.

4,060,227
FOLDER
Glenn A. Landgraf, and Fred H. Ebel, both of Boca Raton, Fla., assignors to Gold Thread Machinery Co., Boca Raton, Fla.
Filed June 29, 1976, Ser. No. 700,752
Int. Cl.[2] B65H *45/22*
U.S. Cl. 270—66 **7 Claims**



1. A small piece folder comprising
- a frame and means for continuously moving articles to be folded including a continuously moving feed conveyor mounted on the frame,
- a pair of width control blades mounted on the frame and overlying the continuously moving feed conveyor,
- means for feeding articles to be folded onto one end of the conveyor beneath the control blades,
- a pair of air tubes positioned to underly the margins of articles carried by the conveyor and having exhaust ports adapted to direct a blast of air upwardly to the side margins of articles as the articles are being moved by the feed conveyor to longitudinally fold the margins over the blades as the articles move,
- and control means including a valve for each of the tubes for sequentially directing compressed air to each to cause the folds to be made in sequence.

4,060,228
PULL-FOOT FEED
Norwood E. Tress, Bath, and Winston A. Orsinger, Bethlehem, both of Pa., assignors to Bell & Howell Company, Phillipsburg, N.J.
Continuation-in-part of Ser. No. 608,970, Aug. 29, 1975, Pat. No. 4,013,283. This application July 29, 1976, Ser. No. 709,826
Int. Cl.[2] B65H *3/08, 3/50*
U.S. Cl. 271—14 **6 Claims**



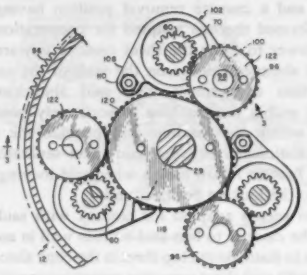
1. In a sheet feeding mechanism for feeding individual sheets separately from a stack comprising:
- a main hopper assembly for supporting a stack of sheets;
- means for drawing an exposed edge of an outer sheet away from the remaining stack;
- a pull-foot moveable between a first position in which it is between the remaining stack and the edge of the outer sheet which has been exposed and a second position in which it is away from the hopper assembly; and
- roller means arranged to cooperate with the pull-foot, for pinching the edge of the outer sheet between it and the pull foot while rolling on the sheet as the pull-foot moves away from the remaining stack and pulls the outer sheets from the remaining stack;
- the improvement wherein said roller means comprises a driving means including a driving shaft for rotating a carrier fixedly mounted on said driving shaft about a driving-shaft axis, a roller segment pivotally mounted on said carrier at a pivot axis offset from said axis of said driving shaft, and a biasing means mounted between said carrier and said roller segment to bias said roller segment to rotate about its pivot axis toward said pull foot, said roller segment having a surface for pinching the edge of the outer sheet between it and the pull-foot while rolling on the sheet in response to rotation of said driving shaft.

4,060,229

ROTARY GLUE PICKER

Sidney T. Carter, Shrewsbury, Mass., assignor to A-T-O Inc., Cleveland, Ohio

Filed Mar. 29, 1976, Ser. No. 671,172
Int. Cl.[2] B65C 9/16; B65H 3/20
U.S. Cl. 271—33 7 Claims



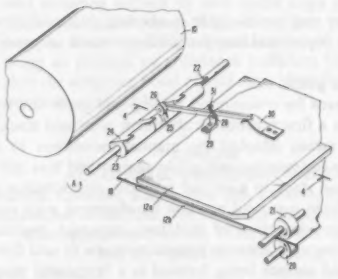
7. Drive mechanism for a picker designed to remove glue from a glue roll, apply it to the flat surface of a label and place the glue-coated label on a transfer turret comprising a support shaft, a support mounted on the support shaft for rotation about the axis of the support shaft, means for rotating the support about the axis of the support shaft, a rotatable shaft mounted on the support with its axis parallel to that of the support shaft and at a predetermined radial distance therefrom for movement in a circle about the axis of the support shaft and for rotation about its own axis during rotation of the support, said rotatable shaft mounting a picker for movement circularly about the axis of the support shaft relative to a glue-applying roll, a label holder and a transfer roll arranged about the axis of the support shaft as a center, and means comprising a drive element fixed to the support shaft having a varying radius of curvature, a drivable element fixed to the rotatable shaft for effecting rotation of the rotatable shaft about its own axis, a transfer element arranged in engagement with the drive and drivable elements for transferring the rotation of one to the other and means supporting the transfer element for radial movement relative to the axis of the drive element while maintaining driving engagement with both the drive and drivable elements.

4,060,230

EMBOSSING GATE ROLLER

Wayne Edward Church, Longmont, and Frederick Fenn Quist, Jr., Boulder, both of Colo., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Nov. 11, 1976, Ser. No. 741,099
Int. Cl.[2] B65H 29/00
U.S. Cl. 271—63 8 Claims



1. In an electrophotographic machine wherein copy paper is moved from a supply area to a transfer station whereat an image of a document to be copied is transferred from an image-bearing drum to said copy paper through contact of said copy paper with said drum, apparatus including:

embossing means located prior to said transfer station in the path of said copy paper, for forming a small embossed section in the leading edge of said copy paper so that said small embossed section including a portion of said leading edge stands away from the surface of said drum when said leading edge is in contact with said drum; and

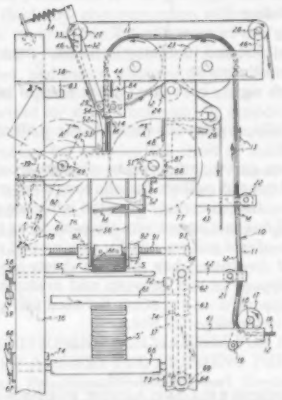
stripper means for removing said copy paper from said drum, said stripper coacting with said embossed section of said copy paper.

4,060,231

APPARATUS AND METHOD FOR STACKING SHEETS

Anton Rudolph Stobb, R.D. 1, and Walter John Stobb, R.D. 1, Box 60, both of Pittstown, N.J. 08867

Filed Oct. 1, 1976, Ser. No. 728,547
Int. Cl.[2] B65H 29/40, 31/32
U.S. Cl. 271—80 12 Claims



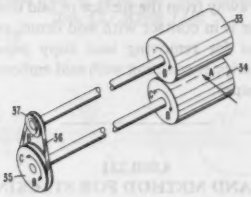
11. Means for stacking sheets of paper, comprising means for supporting sheets of paper in end-to-end spaced-apart relation and with said means having a terminal end where the sheets are released from said means along a path extending from said means, two rotatably mounted means disposed adjacent said terminal end and each having sheet engager means for individually releasably receiving the sheets from the first said means and moving the sheets away from the first said means and being arranged to drop the sheets into a stack when the second said means are rotated, the second said means being disposed on opposite sides of said path of the sheets released by the first said means and being rotatably driven in opposite directions, rotation driver means operatively associated with the second said means and a sheet movement means arranged to monitor the sheets moving toward the second said means and with said driver means and said sheet movement means being operatively associated together for the control of rotation of the second said means in synchronization with the movement of the sheets, an additional control means for rotation of said rotatably mounted means and arranged to interrupt rotation every one-quarter revolution thereof, and said control means and said sheet movement means being operatively associated together for respectively stopping and starting of rotation of said rotatably mounted means for receiving and releasing of the sheets, and receiver means operatively disposed relative to the second said means for receiving the sheets from the second said means and in a stack when the sheets are released by said sheet engage means.

4,060,232

CONTROLLED SLIP PAPER SEPARATOR

David Kent Gibson, Boulder, Colo., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Nov. 12, 1976, Ser. No. 741,426
Int. Cl.[2] B65H 3/46
U.S. Cl. 271—122 1 Claim



1. Apparatus for feeding sheets one at a time from a stack of sheets wherein sheet picking and feeding means are employed for moving at least one sheet from said stack and separating means are employed for receiving sheets from said picking and feeding means and rejecting all but one sheet, said separator means comprising:

a positively driven separator roll;

a retard roll located in contact with said separator roll to form a nip therewith;

a first pulley rigidly connected to the shaft of said separator roll;

a second pulley rigidly connected to the shaft of said retard roll; and

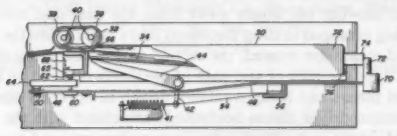
a continuous garter spring means situated around said first and said second pulleys for allowing said retard roll to rotate in a first direction under the influence of said separator roll due to slippage between said garter spring and at least one of said pulleys, and for driving said retard roll in a second direction when multiple sheets are in said nip, when slippage occurs between said multiple sheets, and when slippage does not occur between said garter spring and the two pulleys.

4,060,233

CASSETTE LOADED SHEET FEEDER FOR REPRODUCTION MACHINE

Klaus K. Stange, Pittsford, and Thomas J. Hamlin, Macedon, both of N.Y., assignors to Xerox Corporation, Stamford, Conn.

Filed Nov. 1, 1976, Ser. No. 737,450
Int. Cl.[2] B65H 1/12, 3/04
U.S. Cl. 271—160 3 Claims



1. A reproduction machine having a copy sheet cassette adapted for insertion and removal from the machine for loading copy sheets therein comprising

a cassette having a front wall, a rear wall, side walls and a top wall adapted to receive a stack of copy sheets therein,

a bottom wall, adapted for pivotal movement toward and away from said top wall,

a friction retard sheet feeder adapted for sequentially separating single copy sheets from the top of the copy sheet stack, said friction retard feeder comprising sheet separator means permanently mounted within the reproduction machine and friction retard means mounted on said front wall of the copy sheet cassette,

means for positioning the front wall of the cassette within the reproduction machine to provide the required spacial relationship between said sheet separator means and said friction retard means, said positioning means including an abutment means formed on the front wall of said cassette and a corresponding abutment mounted within the reproduction machine;

a cassette locking lever moveable between a cassette locking position and a cassette removal position having a cam surface formed thereon adapted for cooperation with a cam follower to force the sheet cassette upwardly such that said abutment means on the wall of the cassette is moved into engagement with said abutment means mounted within the machine to accurately position the cassette within the machine and provide the required spacial relationship between said sheet separator means and said friction retard means when said locking lever is moved to the locking position; and,

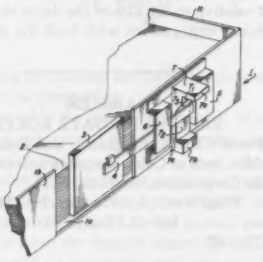
biased lever means adapted for contact with said bottom wall of the cassette to bias said bottom wall in an upward direction to maintain the top sheet in the copy sheet stack in contact with said sheet separator means irrespective of the quantity of copy sheets in the sheet cassette.

4,060,234

CARTRIDGE TRAY FOR USE IN A COPYING MACHINE

Masamitsu Motoyama, Tokyo, Japan, assignor to Rank Xerox Ltd., London, England

Filed July 27, 1976, Ser. No. 709,032
Claims priority, application Japan, Aug. 27, 1975, 50-117006[U]
Int. Cl.[2] B65H 3/56
U.S. Cl. 271—164 2 Claims



1. A paper tray positionable in abuting relationship with a surface of a copier machine for holding a stack of paper comprising

a movable guide,

spring means for continously biasing said guide toward said stack to a first position in abutment with said stack, and

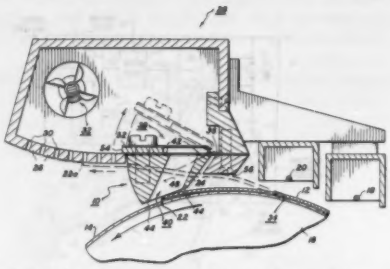
actuator means adapted for manual movement to a first position for moving said guide against said bias and away from said stack to a second position, said actuator means movable to a second position by abutment with said surface upon insertion of said tray into said machine for permitting said actuator means to return to said first position, said surface being located in a horizontal plane and said actuator being movable vertically between said first and second positions, said second position being vertically above said first position.

4,060,235

SELF-LIFTING VACUUM STRIPPER

Donald J. Weikel, Jr., Rochester, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Filed Sept. 1, 1976, Ser. No. 719,642
Int. Cl.² B65H 29/56
U.S. Cl. 271—174 6 Claims



1. In a copying apparatus in which images on a reusable initial image support surface are transferred to copy sheets in electrostatically adhering engagement with said initial image support surface, and in which the electrostatically adhering copy sheets bearing the transferred images are stripped from the initial image support surface, the improvement comprising:

copy sheet transport means substantially spaced from said initial image support surface for transporting copy sheets away from said initial image support surface;

a highly apertured stripper head with a highly apertured unobstructed stripping surface normally closely overlying said initial image support surface,

wherein the ratio of the apertured surface area to the non-apertured surface area of said stripping surface of said stripper head is greater than 1 to 1, and said apertures extend through said stripper head to provide substantially unrestricted air flow through said stripper head,

said stripper head being freely pivotally mounted for rapid movement away from said initial image support surface toward said copy sheet transport means, and

vacuum means applying a high air flow through said stripper head through said apertures therein sufficient to pneumatically strip a lead edge area of a single copy sheet electrostatically adhered to said initial image support surface away from said initial image support surface to said stripping surface, but with a low vacuum pressure only slightly below ambient pressure, which vacuum pressure is insufficient to pivot said stripper head away from said normal position closely overlying said image support surface,

said stripper head being automatically pneumatically self-actuated by said same vacuum means to pivot said stripper head and the lead edge area of said copy sheet away from said initial image support surface toward said copy sheet transport means solely by the coverage of said apertures in said stripping surface by said single copy sheet stripped from said initial image support surface increasing the vacuum force on said stripper head, said stripper head being so pivoted by a distance sufficient to substantially shift the stripping point of said copy sheet from said initial image support surface.

4,060,236

AUTOMATIC SHEET DECURLER

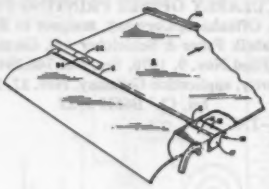
Howard B. Carstedt, Rte. 1, Box 208, Loretto, Minn. 55357

Continuation of Ser. No. 358,981, May 10, 1973, abandoned.
This application Feb. 13, 1976, Ser. No. 657,874
Int. Cl.² B65H 29/70, 29/04
U.S. Cl. 271—183 6 Claims

1. Apparatus for decurling a sheet of material curled downwardly at its trailing end about an axis extending transversely to the direction in which the material is traveling, comprising:

P1 a pair of fixed, elongated support surfaces of arcuate convex shape positioned substantially parallel to each other in spaced apart relation and extending transversely with respect to the path of travel of the sheet to be decurled, and forming a decurling zone between said arcuate support surfaces recessed below the top extremities of said support surfaces, said support surfaces having a length at least as great as the width of said sheet;

means for creating a pressure gradient in said zone between said elongated support surfaces throughout the length thereof sufficient to deform the sheet of material in a direction opposite to the curl in the sheet, said means for creating a pressure gradient comprising a vacuum chamber in fluid flow communication with said decurling zone on the reverse side of said support surfaces from that traversed by a sheet of material, means for evacuating said chamber, and means disposed on the side of the sheet of material opposite the support surfaces for directing a pressurized air stream between the support surfaces into the decurling zone against the sheet material; and



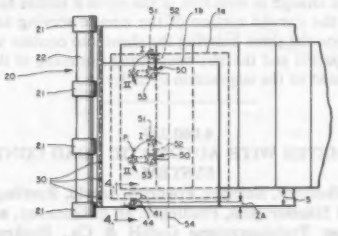
pulling means for drawing the sheet of material over said support surfaces and through said zone, whereby the entire sheet will progressively pass through said zone and be decurled, said pulling means positively engaging the sheet and cooperating with said pressure gradient in said decurling zone to hold said sheet in tension therebetween to facilitate the decurling of said sheet.

4,060,237

SHEET POSITIONING MECHANISM FOR FEED TABLE OF A SHEET-FED PRINTING PRESS

Klaus Degen, Froschhausen, and Herbert Herrmann, Hausen, both of Germany, assignors to Roland Offsetmaschinenfabrik Faber & Schleicher AG, Offenbach, Germany

Filed Feb. 4, 1977, Ser. No. 765,860
Claims priority, application Germany, Feb. 5, 1976, 2604379
Int. Cl.² B65H 9/14
U.S. Cl. 271—231 10 Claims



5. A sheet positioning mechanism for the feed table of a sheet-fed printing press comprising, in combination, a set of releaseable front stops at the front edge of the feed table, a side guide at the side edge of the feed table, wiping means adjacent to the side guide for engaging a sheet which is to be positioned and urging it against the side guide, said wiping means having a limited zone of action, conveyor means for feeding sheets in shingled relation in a straight stream along the feed table, the stream being laterally spaced from the side guide sufficiently to

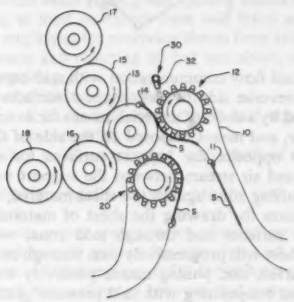
be out of the zone of action of the wiping means, an auxiliary transport device near the front end of the table below the sheet path engageable with and sychronized with the arrival of the sheet to be positioned for transporting the sheet (a) forwardly in the direction of the front stops and (b) laterally from its position in the stream into the zone of action of the wiping means so that the wiping means acts exclusively on the sheet to be positioned free from interference of the wiping means by the following sheet in the stream.

4,060,238

DEVICE FOR THE SMOOTH AND FLUTTER-FREE FEEDING OF SHEETS ON SHEET-FED MACHINES, PARTICULARLY OFFSET PRINTING PRESSES

Claus Simeth, Offenbach, Germany, assignor to Roland Offsetmaschinenfabrik Faber & Schleicher AG, Germany

Filed Nov. 9, 1976, Ser. No. 740,204
Claims priority, application Germany, Nov. 12, 1975, 2550721
Int. Cl.[2] B65H *5/22*
U.S. Cl. 271—276 **5 Claims**



1. A feed drum assembly for feeding sheets in succession to an impression cylinder of a lithographic printing press comprising, in combination, a rotatable core, a cylindrical mantle mounted on the core and having a substantially smooth surface which is concentric with the core, an axially and circumferentially distributed array of spacers spaced radially outward from the surface of the mantle at a constant spacing to define a sheet supporting locus, means for guiding a sheet onto and away from the sheet supporting locus so that the sheet makes only a partial turn about the drum, and axially extensive nozzle means stationarily mounted with respect to the drum and spaced outwardly therefrom for directing high velocity air chordwise of the drum and into the region between the sheet and the mantle, the change in direction of the air as it strikes and tends to follow the curved surface of the mantle serving to create suction upon the sheet drawing the sheet into contact with the array of spacers and thereby preventing fluttering of the sheet as it is passed to the impression cylinder.

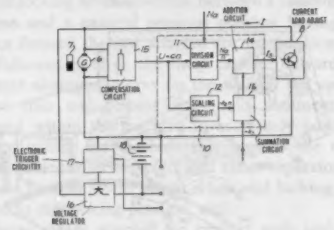
4,060,239

ERGOMETER WITH AUTOMATIC LOAD CONTROL SYSTEM

Werner Pfleiderer, Eningen; Friedrich Arnold, Reutlingen, and Richard Hüussermann, Pfullingen, all of Germany, assignors to Keiper Trainingsysteme GmbH & Co., Rockenhausen, Germany

Filed Sept. 9, 1976, Ser. No. 721,780
Claims priority, application Germany, Sept. 11, 1975, 2540492
Int. Cl.[2] A61B *5/05;* A63B *21/24*
U.S. Cl. 272—73 **5 Claims**

1. An ergometer comprising a direct current generator which is operatively connected with a driving device to be operated by the person being tested, permanent magnets for producing an exciter field, a loading device connected to the outlet of the generator with an electronic load adjusting device for keeping the electrical load of the generator at the pre-set value and an electronic control circuit fed by the generator which determines the nominal value to be set in the loading device, the nominal value being a function of the additional load caused by mechanical losses, wherein the improvement comprises an electronic control circuit including means for providing a nominal value dimension of the load current as a



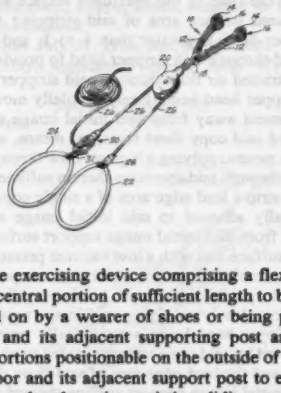
difference from a first portion, on the one hand, and the sum of the second and third portions, on the other hand, whereby the first share is proportional to the quotient of the output (N_a) to the produced by the person being tested and the generator voltage (U), the second share being proportional to the generator voltage (U) and the third portion being constant.

4,060,240

PUSH PULL EXERCISING DEVICE

Virgil M. Dunston, 1408 SW. Donovan, Seattle, Wash. 98106

Filed Apr. 19, 1976, Ser. No. 677,915
Int. Cl.[2] A63B *21/00*
U.S. Cl. 272—126 **2 Claims**



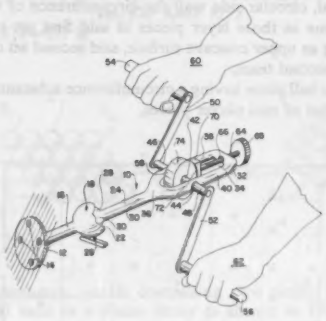
1. A portable exercising device comprising a flexible cross strap having a central portion of sufficient length to be retained by being stood on by a wearer of shoes or being placed between a door and its adjacent supporting post and having enlarged end portions positionable on the outside of said shoes or beyond a door and its adjacent support post to engage the same, said enlarged end portion resisting sliding movement of the cross strap when a tension is placed on a central portion thereof; pulley means for supporting a cable means; pulley connector means disposed between said pulley means and the central portion of said cross strap; a pair of cord connector means for connecting first and second stirrup means to a cable means; first and second handle-stirrup means for grasping by a user during an exercise program; cord means having one end portion thereof connected with said first handle-stirrup means, thence reeved about said pulley means, and thence releasably connected with one of said cord connector means at a location intermediate the cord means length and removed from its other end portion; said other of said cord means including an additional means to permit free sliding movement of said cord means when pulled in one direction and to automatically lock and stop the cord means in response to only pulling in the opposite direction of said cord means when said second handle stirrup means is held stationary.

4,060,241

FRICTION TYPE EXERCISING DEVICE

Edward Hegel, 484 Park Ave., N. Merrick, N.Y. 11566

Filed Oct. 13, 1976, Ser. No. 732,157
Int. Cl.² A63B *21/22*
U.S. Cl. 272—132 **2 Claims**



1. An exercising device comprising a wheel, a frame, said frame including an elongated plate and a rod, one end of the rod fixedly secured to a first marginal edge of the plate, the wheel being disposed journalled to opposed sides of an opening located in the frame, the first marginal edge being disposed intermediate said opposite sides, a shaft, the shaft co-axially aligned with an fixedly secured to the wheel extending outwardly from the frame, a pair of handles fixedly secured eccentrically to the ends of the shaft, means to apply a variable magnitude drag force on the periphery of the wheel, said drag force applying means including a threaded rod, one end of the threaded rod carrying a bar, the bar having a portion of the outer surface thereof arcuately shaped disposed in touching engagement with a portion of the periphery of the wheel, the other end of the threaded rod having a handle fixedly secured thereto, the frame having a threaded hole disposed in a second marginal edge of the plate, the second marginal edge being disposed intermediate said sides and opposite to said first marginal edge, a portion of the threaded rod being disposed in threaded engagement with the threaded hole, the portion of the threaded rod including a portion of the rod intermediate the handle and the bar, said fastening means includes a circular plate, the circular plate having a plurality of holes therein, a plurality of screws, said plurality of holes having said plurality of screws passing therethrough for mounting said circular plate to said mounting surface, means to adjustably position including a block, the block having a hemi-sperhical socket disposed therewithin, the socket having an open mouth portion disposed in the surface of the block, a ball, a portion of the surface of the ball being disposed captured within the socket, the rod being disposed fixedly secured to another portion of the surface of the ball and passing through the open mouth portion, the block being disposed fixedly secured to the circular plate, means to releasingly clamp the ball to the block, means to adjustably position the longitudinal axis of the shaft relative to a stationary mounting surface, means to fasten the frame to said mounting surface.

4,060,242

ELECTRONIC GAME APPARATUS

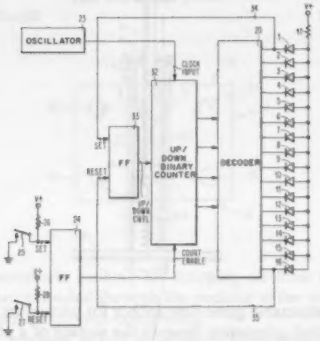
Thomas L. Huang, and Ling Ling Huang, both of 5565-02 Walnut Blossom Drive, San Jose, Calif. 95123

Filed Aug. 21, 1975, Ser. No. 606,439
Int. Cl.² A63B *71/06*
U.S. Cl. 273—1 E **6 Claims**

1. In a game apparatus, the combination comprising:

a series of more than two selectively energized light sources disposed for view by a player;

circuit means for controlling the energization of said light sources, said circuit means being switchable between first and second states and operative when in said first state to progressively and repetitively energize said light sources one-at-a-time to effect the appearance to the player of an illuminated light moving from one end of the series towards the other end, said light sources being energized at a rate allowing the player to operate said apparatus as a game of skill, said circuit means being operative in said second state to energize only one light source to effect the appearance of a stationary light; and,



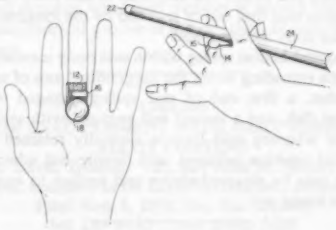
means for switching said circuit means between said states and including player-actuated switch means operative to switch said circuit means from said first state to said second state, whereby a player upon watching the moving light can actuate said switch means and attempt to stop the moving light at a desired one of said light sources, said circuit means including means to reverse the direction in which said light sources are progressively energized, to effect the appearance to the player of an illuminated light moving back and forth.

4,060,243

COMBINATION CHALK HOLDER AND CUE SLIDE

John J. Langan, Box 239, Russell Ave., Frostburg, Md. 21532

Filed June 24, 1976, Ser. No. 699,593
Int. Cl.² A63D *15/16*
U.S. Cl. 273—18 **4 Claims**



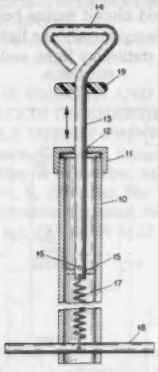
1. In combination, a chalk holder and a flexible cue slide band for encircling a finger of a pool or billiards player, said band including a felt material cue slide portion said band further including on one end thereof a strip of narrower width than said cue slide portion, said strip having Velcro hooks on one side thereof, said band further including on the other end thereof a patch of Velcro loops said Velcro hooks and loops being engaged to fasten said band on a player's finger; said chalk holder being releasably attached to said patch by a means to releasably engage said a chalk holder.

V 9 6 4 / 5 N 0 2 9 7 7 UMI

4,060,244
RETRACTABLE ANCHORS FOR GAME BASES

Robert E. Graham, 2041 Wilson Road, Knoxville, Tenn. 37912

Filed May 22, 1975, Ser. No. 579,923
Int. Cl.[2] A63B 71/00
U.S. Cl. 273—25 3 Claims



1. A retractable game base anchor for permanent installation in a vertical orientation beneath the surface of a playing field, said anchor having a portion thereof for extending above said surface to engage a game base when in use and retract below said surface when not in use, which comprises:

a hollow tubular body member for positioning in said vertical orientation beneath said surface;

a closure covering the upper end of said body member when so oriented, said closure being provided with a central aperture;

a rigid cross arm engaged with the lower end of said body member and extending outwardly from opposite sides thereof to aid in stabilizing said body member, when in use, below said playing field surface;

an axially movable rod disposed along the longitudinal axis of said body member and extending through said central aperture, with a first end of said rod being within said body member and a second end of said rod being exterior of said body member, said second end being formed into a loop, a portion of said loop most distant from said body member being a straight section perpendicular to said rod;

a non-sealing spacer disk encircling and fixedly engaged to said first end of said rod interiorly of said body member to maintain said first end of said rod on the longitudinal axis of said body member; and

an elongated helical spring within said body member having an axis extending along the longitudinal axis of said body member, a first end of said spring engaged with said spacer disk, and a second end engaged with said closure cover whereby said loop is normally retained in a retracted position adjacent said closure but whereby said loop may be elevated above said surface to engage said game base.

4,060,245
SOCCER BOARD GAME

Enrique Gamez Duch, 10a Calle 3-02, Zona 1, Ciudad Guatemala, Guatemala

Filed July 27, 1976, Ser. No. 709,132
Claims priority, application Guatemala, July 28, 1975, 37842
Int. Cl.[2] A63F 9/00
U.S. Cl. 273—85 R 3 Claims

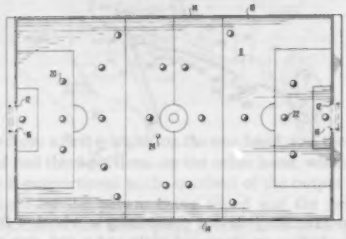
1. A game for instructing the rules of soccer by simulating soccer play on a planar surface having a soccer field layout thereon, comprising;

a pair of goals for placement at either end of said soccer field layout,

a first set of round player pieces, each of which has a vertical circular side wall and an upper concave surface, said first set comprising a first team,

a second set of round player pieces each of which has a vertical, circular side wall the circumference of which is the same as those layer pieces in said first set and each having an upper concave surface, said second set comprising a second team,

a circular ball piece having a circumference substantially less than that of said player pieces,



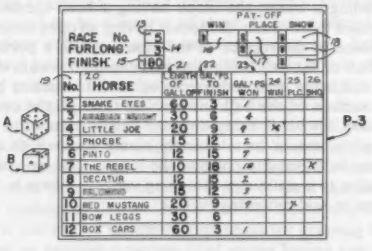
first and second shooting discs having a circumference substantially the same as said player pieces and having a relatively thin body and an enlarged semicircular edge about its periphery,

whereby first and second players are given, respectively, one of said discs and first and second sets of said players and said players dispose said sets according to their tactics and in accordance with certain game rules and said shooter discs are utilized to slide over said concave surfaces of said players to impel said players with sufficient force to strike said ball piece and move said ball piece toward one of said goals.

4,060,246
HORSE-RACE-SIMULATING PARLOR OR CASINO GAME OF PURE CHANCE

Leslie J. Ward, 2450 Blackwood Drive, Vineland, N.J. 08360

Filed Apr. 25, 1977, Ser. No. 790,710
Int. Cl.[2] A63F 3/00
U.S. Cl. 273—135 AA 21 Claims



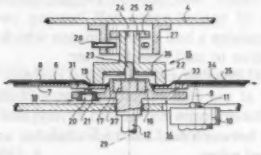
18. A game of pure chance comprising a combination of a pair of dice which can be rolled to eleven numbers, from 2 through 12, and a play-board having thereon eleven play-numbers, from 2 through 12, and having thereon means for indicating a finish-number which is an integral-number-multiple of the lowest common multiple of the numbers representing the ways in which said eleven play-numbers can be rolled by the dice, and having thereon a chance-equalizing number for each play-number which chance-equalizing-number is said lowest-com-

mon-multiple divided by the number of ways the play-number can be rolled by the dice.

4,060,247
GEOMETRIC PUZZLE
Robert E. Kobres, Jr., Rte. 1, Nicholson, Ga. 30565
Filed June 28, 1976, Ser. No. 681,519
Int. Cl.² A63F 9/12
U.S. Cl. 273—157 R **2 Claims**

1. A geometric puzzle comprising two pieces having six connected balls in a planar array as shown in FIG. 1, two pieces having two connected balls as shown in FIG. 2, and one piece having four connected balls in planar array as shown in FIG. 3, said pieces being assemblable into either a two dimensional rhomboid or a three dimensional tetrahedron.

4,060,248
PLAYING APPARATUS, IN PARTICULAR A VIDEO PLAYER FOR PLAYING A RECORD WHICH IS MADE OF A TRANSPARENT MATERIAL AND PROVIDED WITH A CENTRAL HOLE
Herman Gerard Lakerveld; Gerard Eduard van Rosmalen; Kornelis Bulthius, and Johannes Petrus Sinjou, all of Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.
Filed June 5, 1975, Ser. No. 583,987
Claims priority, application Netherlands, Mar. 12, 1975, 7502416
Int. Cl.² G11B 7/24; H04N 1/28
U.S. Cl. 274—41.6 R **2 Claims**



1. An apparatus for playing a round disc provided with a center hole and a transparent body reflectively encoded with optically readable information on a surface of the transparent body, the apparatus comprising:

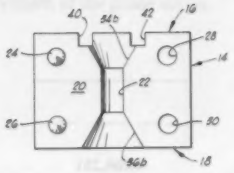
a housing,

a motor driven drive spindle extending from said housing, p1 optical means mounted in said housing for radial movement with respect to said drive spindle for projecting a light beam through said transparent body of said record to said reflectively encoded surface of said body and for receiving light reflected from the encoded surface and modulated thereby, said optical means being primarily adapted to read a rigid record of a specific standard thickness,

a detachably mounted plane parallel transparent adapter disc for adapting said apparatus to play relatively thin flexible foil disc records, said adapter disc being provided with a center hole and having a thickness and a refractive index sufficient to substantially remove the spherical aberration produced by the difference in thickness between the rigid disc and the foil disc and having a diameter substantially equal to that of said foil disc, and

means for tiltably and rotatably mounting said adapter disc on said drive spindle.

4,060,249
ROD PACKING
Milton G. Stowe, Dallas, and Barry J. Brooks, Midland, both of Tex., assignors to WPC, Inc., Midland, Tex.
Filed Dec. 17, 1976, Ser. No. 751,390
Int. Cl.² F16J 15/00
U.S. Cl. 277—24 **9 Claims**



1. An elastomeric packing for stripping oil from an elongated member extended through the packing as the member is removed from an oil well comprising:

a pair of packing halves detachably interconnected at a central plane of the packing, and each including a planar central face substantially coplanar with said central plane of the packing and having a semicylindrical groove formed centrally therein and a guiding cavity communicating with one end of said semicylindrical groove for guiding said elongated member into said cavity as said member is pulled through the packing;

a plurality of spaced, cylindrical pins projecting normal to said central planar face and disposed to one side of said semicylindrical groove;

a plurality of spaced cavities on the opposite side of said semicylindrical groove from said pins, each of said cavities being dimensioned and configured to mate with, and tightly receive, one of said pins;

a pair of opposed end faces intersecting said planar central face, one of said end faces having said rod-guiding cavity opening in said face; and

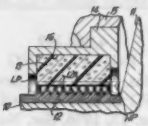
oil channel means in the other of said end faces communicating with said semicylindrical groove for receiving oil carried through said semicylindrical groove on said elongated member when said member is moved through said semicylindrical groove in the direction of said oil channel means.

4,060,250
ROTOR SEAL ELEMENT WITH HEAT RESISTANT ALLOY COATING
Hugh M. Davis, Trenton, N.J., and Alan H. Miller, Philadelphia, Pa., assignors to De Laval Turbine Inc., Princeton, N.J.
Filed Nov. 4, 1976, Ser. No. 738,903
Int. Cl.² F16J 15/44; F01D 5/28
U.S. Cl. 277—53 **6 Claims**

1. In rotary machinery, including a wear ring seal member stationarily mounted in a holding member so as to extend generally coaxially about a rotatable cylindrical member in substantially sealing relationship with the surface of said rotatable member, said rotatable member being made of a low alloy carbon steel, the improvement,

wherein the surface of said rotatable cylindrical member is substantially completely covered by a fused welding alloy coating metallurgically bonded thereto,

said weld coating being formed of a heat and corrosion resistant alloy composition containing by weight about



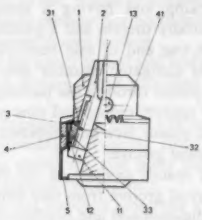
10% to 30% chromium and the balance at least about 60% nickel.

4,060,251

CHUCK WITH KEY TIGHTENING

Claude Amyot, Les Gras, France, assignor to Etablissements Amyot S.A., Pontarlier, France

Filed Feb. 6, 1975, Ser. No. 547,590
Claims priority, application France, Feb. 19, 1974, 74.05528
Int. Cl.[2] B23B *31/04*
U.S. Cl. 279—62 8 Claims



1. A chuck useful in percussion drilling and being of the type receiving a tool at the front thereof and being tightened with a key and having a chuck body, threaded tool gripping means which are guided for translatory movement in grooves in the chuck body and which are inclined with respect to the longitudinal axis of the chuck, a split tightening nut with threads engaging the gripping means, a toothed ring for engaging the key and connected to rotate the tightening nut, and a protective skirt member fixed coaxially to the toothed ring and at least partially surrounding the chuck body rearwardly of the toothed ring, the chuck being characterized by:

a retaining shoulder on the toothed ring with a smaller diameter than the external diameter of the tightening nut, said retaining shoulder being frontward of the tightening nut,

interfitting shoulder means for mounting the protective skirt member to prevent the skirt member from sliding rearwardly during percussion drilling,

said interfitting shoulder means including a shoulder on the tightening nut with the protective skirt member being fitted onto said shoulder on the tightening nut,

said protective skirt member comprising a first part of small diameter at the tool side of the chuck and a second part of large diameter at the machine side of the chuck, said parts being connected by a central shoulder region, and

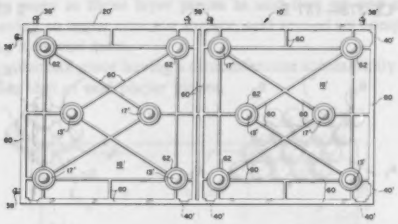
the skirt member being surrounded, at least over a portion of the length of the small diameter part, by the toothed ring.

4,060,252

BALL TYPE TRANSFER APPARATUS

Geoffrey John Mowery, 27349 Miles Rd., Chagrin Falls, Ohio 44022

Continuation-in-part of Ser. No. 521,547, Nov. 6, 1974, abandoned. This application Nov. 14, 1975, Ser. No. 631,975
Int. Cl.[2] B62B *1/00*
U.S. Cl. 280—79.1 R 8 Claims



1. A ball type transfer apparatus particularly adapted for transferring bodies from a first location to a second location comprising in combination:

a base member;

ball bearing means for providing omnidirectional rolling engagement with the ground surface beneath the transfer apparatus; and

interlocking means for interchangeably interlocking any number of ball type transfer apparatus together to provide for the fabrication of ball type transfer apparatus of different dimensions to suit particular needs;

said base member having a plurality of spaced-apart ball bearing cavities, each of which contains a ball bearing means that is resiliently captured in said ball bearing cavity and freely rotatable relative to said base member, with a portion of said ball bearing means protruding outwardly of the lower face of said base member such that the ball bearing means supports the base member above the ground surface and provides for omnidirectional rolling engagement with the ground surface beneath the ball type transfer apparatus;

said base member being a generally planar member including a top surface, a bottom surface and a continuous sidewall, said top and bottom surfaces being substantially opposed to each other, said bottom surface further including a plurality of spaced-apart ball bearing cavities, each of which contains a ball bearing means which is freely rotatable relative to said base member;

each of said bearing cavities being defined by a ball race chamber at one end of said cavity, a resilient chamfered edge at the opposite end of said cavity, and a main bearing chamber between said ball race chamber and said resilient chamfered edge;

said resilient chamfered edge being located at said bottom surface of said base member and extending inwardly from said bottom surface to said main bearing chamber;

said main bearing chamber being defined by a generally cylindrical bore having a larger diameter than the diameter of said resilient chamfered edge;

said ball race chamber being defined by a generally cylindrical bore having a diameter less than the diameter of said main bearing chamber;

said resilient chamfered edge, main bearing chamber the ball race chamber being axially aligned;

said ball bearing means being comprised of a ball race and a main bearing, both captured in said ball bearing cavity, said ball race being positioned in said ball race chamber in rolling engagement with said base member, said main bearing being rotatably supported between said ball race and said resilient chamfered edge of said base member, said ball bearing means being resiliently captured in said ball bearing cavity by said resilient chamfered edge which has a diameter smaller than the diameter of said main

bearing such that said main bearing is held in said ball bearing cavity between said ball race and said resilient chamfered edge;

said interlocking means being comprised of outwardly extending integral locking pins located on two adjacent sides of said continuous sidewall and inwardly extending pin receiving sockets located on the other two adjacent sides of said continuous sidewall;

said locking pins each having an elongated shaft portion terminating in an outermost head portion enlarged from said shaft portion, said locking pins adapted to be closely received in the pin receiving sockets of other similar base members whereby said head portions may retainingly maintain said base members in at least one of closely spaced unitary side by side and end to end relationships to each other.

4,060,253

METHOD AND APPARATUS FOR SKATEBOARD SUSPENSION SYSTEM

Eric W. Oldendorf, 2805 Angelo Drive, Los Angeles, Calif. 90024

Filed Mar. 8, 1976, Ser. No. 664,812
Int. Cl.² A63C *17/00*
U.S. Cl. 280—87.04 A **9 Claims**

1. In a skateboard having a board and front and rear truck assemblies for supporting the board, each truck assembly having wheels rotatably mounted on an axle which is pivotally mounted at a pivot angle to a mounting bracket, the improvement comprising:

angle pad means for being removably sandwiched between the truck assemblies and the board for supporting said board on said truck assemblies,

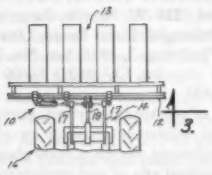
and said pad means comprising an individual pad for each truck assembly, each of said pads having interface angles respectively with the truck assemblies and board for altering the effective pivot angle of the truck assemblies between the board and the wheels.

4,060,254

IMPLEMENT RE-ALIGNMENT HITCH

Arnold E. Ernst, Wolverton, Minn. 56594

Filed Jan. 12, 1976, Ser. No. 648,413
Int. Cl.² B60D *1/14*
U.S. Cl. 280—461 A **8 Claims**



1. Apparatus for maintaining an implement having a tool bar in a controlled position behind a prime mover having a conventional three-point hitch arrangement with a draw bar including an upper arm and a pair of lower lift arms, the upper arm pivotally connected to a mounting device secured to a tool bar, said apparatus comprising:

a pair of rock arm means, each of which includes an upright plate, each plate adapted to be connected at its lower end to a respective lower lift arm, said rock arm means being mounted for movement transverse of the tool bar;

a pair of bracket devices, each bracket device secured to the tool bar in a spaced relationship thereon;

means rotatably connecting each bracket device to a respective plate at a point on said plate intermediate the ends thereof; and

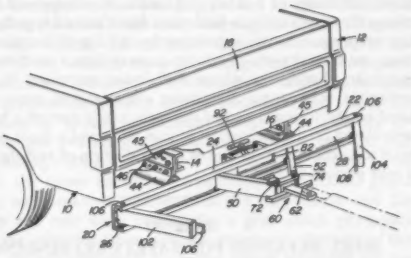
means for moving said plates simultaneously including a fluid operated piston and cylinder device, one end of which is pivotally connected to the tool bar and the other end of which is operatively connected to said plates at their upper ends, said plates moved normally in a vertical plane about their lower ends, whereby said plates above their lower ends move in a direction normal to the direction of movement of the prime mover.

4,060,255

WIDE RANGE BUMPER MOUNTED HITCH

Benjamin G. Zimmerman, Carlock, Ill., assignor to Dennis Wettstein, Eureka, Ill., a part interest

Filed Mar. 16, 1976, Ser. No. 667,375
Int. Cl.² B60D *1/00*
U.S. Cl. 280—478 R **8 Claims**



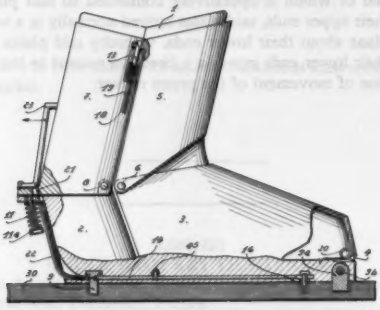
1. In combination, an elongated horizontal base member for mounting in transverse position on one end of a towing vehicle, a pair of horizontal support arms, one pair of corresponding ends of said support arms and said base member including coacting support means supporting said one pair of ends on said base member, at points spaced therealong, for shifting along said base member and horizontal swinging of said arms relative to said base member about upstanding axes shiftable along said base member with said one pair of arm ends between first outwardly convergent positions and second substantially aligned positions generally paralleling said base member with said one pair of arm ends disposed remote from each other and the other pair of arm ends disposed adjacent each other, said coacting support means including means supporting said support arms from said elongated base member against angular displacement of said arms about said base member during sliding and horizontal swinging movement of said support arms relative to said base member, and a hitch member to which said other pair of arm ends are pivotally secured, said hitch member and said base member including lock means operative to releasably lock said hitch member in position relative to said base member when said arms are disposed in said second positions thereof.

4,060,256

DEVICE FOR CONNECTING A SKIER'S LEG TO A SKI

André Marcel Collombin, Avully, Switzerland, and Georges Pierre Joseph Salomon, Bordet-a-Quintal, France, assignors to Ets. Francois Salomon et Fils S.A., Annecy, France

Filed Nov. 28, 1975, Ser. No. 635,592
Claims priority, application Switzerland, Nov. 28, 1974, 15790/74; Nov. 4, 1975, 14192/75
Int. Cl.[2] A63C 9/08
U.S. Cl. 280—613 12 Claims



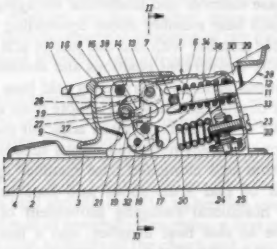
1. Apparatus for connecting the leg of a skier to a ski, comprising a rigid casing in at least three parts, means articulatedly interconnecting said parts for vertical swinging movement relative to each other about a plurality of horizontal axes that are perpendicular to the length of the ski, means for fixing the casing to a ski, locking means for releasably securing together said parts of said casing in a position closely to surround a lower extremity of a skier, and means to release said locking means thereby to release said parts from locked together position responsive to the imposition by the leg of the skier on at least one of said parts of a force greater than a predetermined maximum thereby to release said lower extremity from said apparatus, said casing comprising a base and an upper articulated on the forward end of the base, a rear part of a boot top articulated on a rear portion of said base, and a front part of a boot top articulated on one of a rear portion of said upper and a rear portion of said base.

4,060,257

HEEL RETAINER FOR SAFETY SKI-BINDINGS

Roland Jungkind, Garmisch-Partenkirchen, and Gerhard Sedlmair, Farchant, both of Germany, assignors to Hannes Marker, Garmisch-Partenkirchen, Germany

Filed July 12, 1976, Ser. No. 704,626
Claims priority, application Germany, Feb. 27, 1976, 2608073
Int. Cl.[2] A63C 9/08
U.S. Cl. 280—626 9 Claims



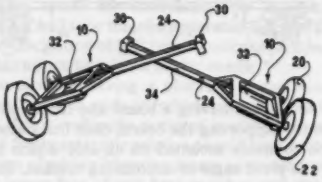
1. A heel retainer for a safety ski-binding, comprising a supporting member, means for fixing said supporting member to a ski, a sole holder, means for pivoting said sole holder to the supporting member about a horizontal transverse shaft and means for displacing said sole holder in slots substantially parallel to the ski, said sole holder comprising a closing pedal, a first spring means positioned between the sole holder and supporting member for keeping the sole holder in the operative or open position, a handle means for deliberately relieving the sole holder, and a second spring means for biassing said transverse shaft of the sole holder at least approximately in the direction of the slots in the supporting member towards the ski tip, wherein said supporting member comprises a housing and an entrainment member means for the sole holder, a horizontal transverse pivot shaft, means for pivoting said entrainment member means about said pivot shaft, suspending means for suspending said sole holder from said entrainment member means comprising a slot and a horizontal transverse pin respectively provided on said sole holder and entrainment member means, wherein said first spring means engages said entrainment member means.

4,060,258

TOW TRUCK DOLLY

Norbert G. Pigeon, 59 Rg Nord - West, R.R. No. 1, Ste. Madeleine Co., St. Hyacinthe, Canada (J0H 1S0)

Filed June 22, 1976, Ser. No. 698,774
Int. Cl.[2] B62B 3/02
U.S. Cl. 280—638 7 Claims



1. A dolly member for supporting a wheel of a towed vehicle comprising a rigid frame, a trough member supported by said frame for receiving a wheel of a towed vehicle, a pair of longitudinally aligned wheels pivotally mounted on one side of the frame, at least one beam transversely secured to said frame on the side opposite the wheels, a stirrup-shaped member rigidly secured sideways near the end of said beam. the open side of said stirrup-shaped member facing downwardly, whereby when a pair of said dolly members are disposed opposite one another and the beams are adjacent one another, the stirrup-shaped member is adapted to hook onto and firmly engage to the beam of the opposite dolly member so that the bottom side of said latter beam is the only one free for movement.

4,060,259

IMPLEMENT TRANSPORTING DEVICE

Roy J. Mefferd, 219 W. Myrtle, Laurens, Iowa 50554, and Gregory L. Mangold, Rural Route, Linn Grove, Iowa 51033

Filed Aug. 2, 1976, Ser. No. 710,431
Int. Cl.[2] B62D 53/00
U.S. Cl. 280—656 8 Claims

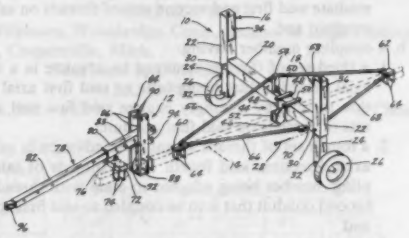
1. A device of the kind described, comprising:

an elongated implement having an elongated implement frame, implement wheels pivotal about an axis parallel to the longitudinal axis of said implement, and tongue means extending transversely from said longitudinal axis of said implement intermediate the opposite ends thereof;

a transporting wheel assembly mounted to said implement frame intermediate the opposite ends thereof, said wheel assembly comprising a pair of spaced-apart vertical legs, each of said legs having upper and lower leg members, means for rigidly securing said upper leg member to said implement frame, said lower leg member being vertically extensibly mounted with respect to said upper leg member each of said lower leg members having a transporting

wheel mounted thereon for rotation about an axis transverse to the longitudinal axis of said implement;

power means connected to said legs for causing vertical extensive movement of said lower leg member from a retracted position wherein said transporting wheel is



above said implement wheels to an extended position wherein said transporting wheels are below said implement wheels;

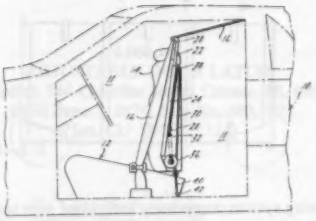
a transporting tongue assembly mounted to one end of said elongated implement frame and having a transporting tongue for attaching to a pulling vehicle.

4,060,260

SEAT BELT CONTROL SYSTEM

Cecil A. Collins, Pontiac, Mich., assignor to Robert C. Fisher, West Palm Beach, Fla.

Filed May 14, 1976, Ser. No. 686,266
Int. Cl.[2] B60R *21/10*
U.S. Cl. 280—747 4 Claims



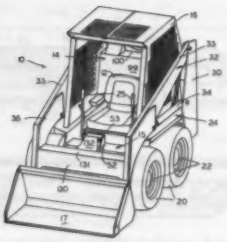
1. In a vehicle having a seat provided with a back which is foldable forwardly, a door port permitting access to said seat and to the area in rear thereof when said back is folded forwardly, a shoulder strap extending normally from a point behind said foldable back near the top of said vehicle downwardly to the upper corner of said back adjacent to said door port, a guide member having an aperture at the top through which the shoulder strap extends, said guide member having a downwardly extending rod, a tube on said foldable back in which the rod extends, a pair of interconnected pulleys of different diameter mounted near the base of said back, flexible means connecting the pulley of smaller diameter adjacent to the seat, flexible means connecting the pulley of large diameter to said rod whereby when the back is folded forwardly the rotation of the two pulleys due to the one flexible means wound on the pulley of smaller diameter operates the flexible member on the pulley of larger diameter to extend the rod and therefor the guide member a greater distance than would have occurred if the pulleys were of the same diameter.

4,060,261

LOADER MAIN FRAME FOR SKID STEER LOADER

James J. Bauer, Lisbon, and Thomas M. Sagaser, Gwinner, both of N. Dak., assignors to Clark Equipment Company, Buchanan, Mich.

Filed Feb. 2, 1976, Ser. No. 654,262
Int. Cl.[2] B60R *21/02*
U.S. Cl. 280—756 2 Claims



1. A skid steer loader vehicle and vehicle main frame in combination, the main frame comprising laterally spaced, longitudinal extending side beams on opposite sides of the vehicle centerline, crossmembers mounted between the side beams at opposite ends thereof, said members partially enclosing a center compartment, said side beams having outwardly disposed flanges overlying opposite pairs of side wheels for the vehicle, a pair of upright members mounted on respective side beams at the rear thereof, the upright members disposed outwardly of the side beams and projecting upwardly from adjacent the rear of each side beam, a rear crossmember provided between an upper end of the uprights, and an upper enclosure mounted on the main frame and overlying the center compartment of the vehicle, the enclosure disposed forwardly of the uprights of the vehicle, the enclosure generally of two-piece construction and including side, top and rear walls and an open front wall providing entry to the enclosure, the side walls terminating in mounting surfaces comprising inwardly directed flanges overlying the side beam flanges and the rear wall including outwardly directed tabs engaging the rear cross member, the upper enclosure comprising an overhead guard defining an operator's compartment for the vehicle and the side, top and rear walls comprising a grid which physically isolates the operator from movable structural elements of the vehicle, energy absorbing mounting means provided on the main frame between the mounting surfaces of the overhead guard and the mounting surfaces of the frame to vibrationally isolate the overhead guard from the vehicle, and mounting locations for the upper enclosure provided on the side flanges of the side beams and at opposite ends of the rear crossmember for mounting the enclosure on the vehicle.

4,060,262

RECORD MATERIAL

Theodore Maierson, Dayton, Ohio, assignor to The Standard Register Company, Dayton, Ohio

Filed Mar. 24, 1976, Ser. No. 669,960
Int. Cl.[2] B41M *5/16, 5/22*
U.S. Cl. 282—27.5 10 Claims

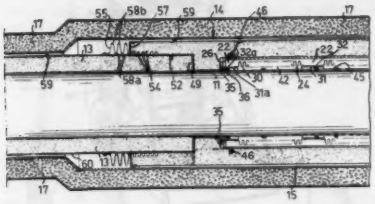
1. A record sheet sensitized with an acidic reactant for developing a color in an oily printing liquid containing a colorless, basic, chromogenic dye-precursor applied thereto by expression of droplets retained by pressure-rupturable wall material located in the sensitized sheet or in an overlying sheet placed against the sensitized sheet, wherein at least one surface of the sensitized sheet bears a substantially colorless, liquid ink comprising an acidic phenolic resin and a lower-alkyl gallate with both the resin and the gallate dissolved in a liquid organic solvent having a boiling point above 300° C and a vapor pressure at 100° C of 1 mm. of mercury or less.

4,060,263

CONDUIT FOR CONVEYING A FLUID, THE TEMPERATURE OF WHICH IS DIFFERENT FROM THE SURROUNDING TEMPERATURE

Michel Kotcharian, Paris, France, assignor to Technigaz, Paris, France

Filed Feb. 6, 1976, Ser. No. 656,071
Claims priority, application France, Feb. 24, 1975, 75.05679
Int. Cl.² F16L 9/22, 59/16
U.S. Cl. 285—47 20 Claims



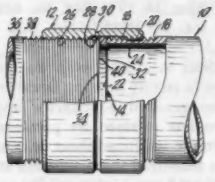
1. Conduit for conveyance of a fluid, in particular a fluid whose temperature is substantially different from the surrounding or ambient temperature, including a circulation pipe for the said fluid, sheath means of insulating material surrounding and engaging said pipe and an outer rigid covering surrounding and protecting said sheath means, characterized in that the said sheath means of insulating material is interrupted at substantially regular intervals and said sheath means forming at each interval at least one fluid-tight lap joint having a coaxial structure and a variable lap surface, that the said circulation pipe is interrupted and terminates at the region of each interval in two spaced ends defining between themselves a gap in said circulation pipe, and that said pipe communicates, through the medium of said gap, with a fluid-tight, substantially annular cylindrical space outside the said pipe, a stationary coaxial sleeve surrounding and spaced from said pipe and surrounded by said lap joint of said sheath means, said sleeve extending across and beyond said gap over a certain length and two corrugated waved compensators, a pair of connecting members respectively fixedly connecting said compensators to said pipe at the region of said two ends thereof, fixing means fixing said compensators at portions thereof respectively distant from said pipe ends to said stationary sleeve, said sleeve and compensators defining between themselves said substantially annular cylindrical space with which said pipe communicates through said gap thereof, and attaching means attaching said sleeve to said outer rigid covering for maintaining said sleeve stationary.

4,060,264

SWIVEL CONDUIT COUPLING ASSEMBLY

Padej Gajajiva, Elmhurst, N.Y., assignor to I-T-E Imperial Corporation Efcor Division, East Farmingdale, N.Y.

Filed June 16, 1976, Ser. No. 696,545
Int. Cl.² F16L 15/00
U.S. Cl. 285—175 8 Claims



1. A swivel conduit coupling assembly comprising:

a. a first conduit having;

1. a first set of threads formed proximate a first end thereof, said first set of threads on said first conduit being arranged to advance in a first axial direction;

2. a second set of threads formed adjacent and axially inward of said first set of threads, said second set of threads on said first conduit being arranged to advance in said first axial direction; and

3. a first annular, axially elongated groove formed intermediate said first and second sets of threads on said first conduit; and

b. a coupling member having:

1. a third set of threads arranged to advance in a second axial direction that is opposite to said first axial direction to thereby matingly engage said first and second sets of threads on said first conduit;

2. a fourth set of threads arranged to advance in said first axial direction, said fourth set of threads of said coupling member being adapted to mate with threads on a second conduit that is to be coupled to said first conduit; and

3. a second annular, axially elongated groove intermediate said third and fourth sets of threads on said coupling member; and

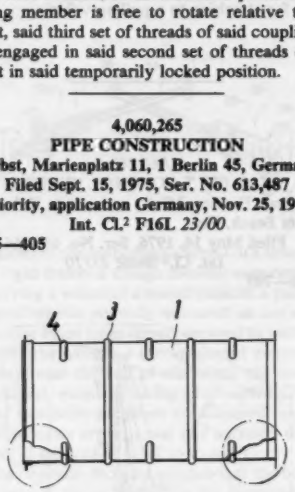
c. said third set of threads of said coupling member being movable from a temporarily locked position, with respect to said first conduit, to an unlocked position when said coupling member is free to rotate relative to said first conduit, said third set of threads of said coupling member being engaged in said second set of threads of said first conduit in said temporarily locked position.

4,060,265

PIPE CONSTRUCTION

Donald Herbst, Marienplatz 11, 1 Berlin 45, Germany

Filed Sept. 15, 1975, Ser. No. 613,487
Claims priority, application Germany, Nov. 25, 1974, 2456070
Int. Cl.² F16L 23/00
U.S. Cl. 285—405 1 Claim



1. A piping system comprising individual pipe sections, each pipe section having a rectangular cross-section, the opposite ends of each pipe section having corner areas with a curvature of radius which allows for a contiguous, outwardly directed edge defining a flange formed by bending the ends of each pipe section;

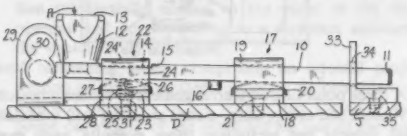
frames for joining the individual pipe sections, each frame being adjacent an end edge flange and snugly fitting the outside wall of each individual pipe section, said frames, each being formed by bending a continuous L-shaped angle iron piece to conform to the peripheral contour of the outside wall of said pipe section such that said bent continuous L-shaped angle iron piece has corner areas with a curvature of radius that conforms to the corner areas of said pipe section and the opposing ends of said angle iron piece are in abutment, said frame ends being welded, one leg of said angle iron piece being adjacent to and parallel with said outside wall, while the other leg of said angle iron piece is adjacent to and parallel with said flange;

a first plurality of longitudinally spaced reinforcing bands encircling each pipe section; and

a second plurality of reinforcing bands located between said

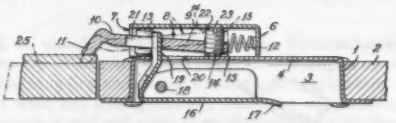
first reinforcing bands and covering only said corner areas for providing torsional stiffness to said pipe section.

4,060,266
SURFACE BOLT
Eric Wilkinson, Woodbridge, Conn., assignor to Leigh Products, Inc., Coopersville, Mich.
Filed June 1, 1976, Ser. No. 691,415
Int. Cl.[2] E05C *1/04*
U.S. Cl. 292—148 3 Claims



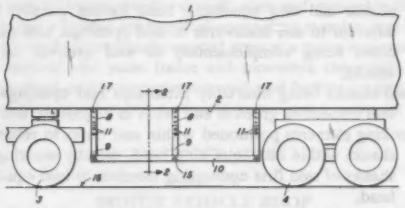
1. A surface bolt assembly comprising, an elongated bolt body having top and bottom surfaces and forward and rearward ends, forward and rearward guides for said body, the body being slidable longitudinally in said guides between locked and unlocked positions, a knob projecting from said top surface adjacent the rearward end of the bolt, and means adjacent the rearward guide adapted to receive a bolt stopping member, said means being constituted by projecting elements disposed on opposite sides of the path of movement of the bolt and knob, said elements having holes aligned to receive said bolt stopping member in either of two positions, wherein in a first of said positions said bolt stopping member is engagable with said bolt to prevent movement thereof in one direction, and in a second of said positions said bolt stopping member is engagable with said knob to prevent movement thereof in the opposite direction.

4,060,267
ADJUSTABLE DOOR LATCH
Paul Monfardini, 744 Chandler Road, Gurnee, Ill. 60031
Filed June 7, 1976, Ser. No. 693,307
Int. Cl.[2] E05C *1/12*
U.S. Cl. 292—173 7 Claims



1. In a hinged door latch comprising a bolt case adapted to be mounted upon a door, a bolt arranged for axial reciprocating movement within said case and including a catch at the forward end thereof, and means for moving said bolt in extension and retraction to latch and unlatch the door, the improvement which comprises means affixed to and carried by said bolt for adjusting the angle of emergence of said bolt whereby to laterally adjust the extended position of said catch, said means comprising a post mounted for axial adjustment transversely of said bolt at the rear end thereof, said post extending in sliding relationship between top and bottom inner surfaces of the bolt case, and a fulcrum element mounted transversely of the bolt in the forward portion thereof rearwardly of the catch, said fulcrum element extending in sliding relationship between top and bottom inner surfaces of the bolt case.

4,060,268
GUARD RAIL DEVICE
William H. Page, Jr., 200 Cemetary St., Oakland, Ill. 61943
Filed Jan. 5, 1977, Ser. No. 756,751
Int. Cl.[2] B60R *19/00*
U.S. Cl. 293—62 1 Claim



1. A height adjustable guard rail device for attachment to each side of a large wheel diameter vehicle to prevent an object colliding into the side of the vehicle from falling under the rear wheels thereof comprised of:

a. a horizontal guard rail extending from about the rear of the front wheels to about the front of the rear wheels of the vehicle and extending substantially within the plane of the rear and front wheels of the vehicle, said guard rail positioned at such a height that as the vehicle travels across a road surface the guard rail does not touch the road surface:

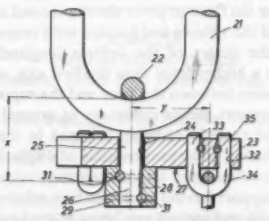
b. a plurality of upper vertical braces attached to the underside of the vehicle and attached to a plurality of lower vertical braces, the lower vertical braces being attached to the horizontal guard rail;

c. a plurality of upper diagonal braces attached to the underside of the vehicle and attached to a plurality of lower diagonal braces, the lower diagonal braces being attached to the horizontal guard rail;

d. wherein the upper and lower diagonal and vertical braces are slidably mounted to each other allowing for the guard rail to be secured in raised or lowered positions; and

e. the upper diagonal brace is rotatably mounted to the underside of the vehicle and the lower diagonal brace is rotatably mounted to the guard rail.

4,060,269
EQUALIZING HEAD FOR CHAIN SLINGS
Werner Rieger, Haus Haselbach, 7080 Aalen 9; Manfred Böning, Klistostrasse 20a, 1000 Berlin 37; Hans Dalferth, Haydnstrasse 21, 7083 Wasseralfingen, and Reinhard Smetz, Baldingerstrasse 2, 8860 Nordlingen, all of Germany
Filed Apr. 8, 1976, Ser. No. 675,179
Claims priority, application Germany, Apr. 15, 1975, 2516817; Apr. 15, 1975, 7512193[U]; Apr. 15, 1975, 7512194[U]
Int. Cl.[2] B66C *1/10*
U.S. Cl. 294—78 A 13 Claims



1. In an improved equalising head for a chain sling of the type comprising a hanger, a first connecting member for connecting the hanger to an equalising head, and a plurality of

secondary connecting members for connecting individual falls of chain to said equalising head, the improvement comprising:

said first connecting member being a clevis-type shackle ending in shanks, said shanks of said first connecting member having parallel grooves on opposite sides thereof,

said equalising head having openings therein to receive said shanks and said equalising head having parallel bores adjacent to and transverse to said openings, said parallel bores being complementary to said grooves on said shanks,

said shanks being insertably fitted into said openings with said respective grooves and bores in alignment, and

locking elements positioned within said bores to retain said shanks within said equalising head, thereby securing said shanks of said first connecting member to said equalising head,

whereby said first connecting member is detachably fastened to said equalising head.

4,060,270

DEVICE FOR STOWING AWAY A SPARE-WHEEL ON AN AUTOMOBILE VEHICLE

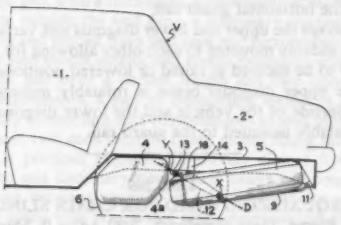
Jean Croissant, Freneuse, France, assignor to Automobiles Peugeot, Paris, France

Filed June 22, 1976, Ser. No. 698,503

Claims priority, application France, July 7, 1975, 75.21251

Int. Cl.² B60P *3/22*

U.S. Cl. 296—37.2 **10 Claims**



1. A device for stowing away a spare-wheel adjacent an end of a vehicle and comprising, in combination with a floor of the vehicle and a fuel tank carried under the floor, support means mounted under the floor, a basket for carrying and locating the spare-wheel between the tank and said end of the vehicle and mounted on the support means to be pivotable about a first axis extending transversely of the vehicle, the support means being mounted under the floor to pivot about a second axis extending transversely of the vehicle and located with respect to the first axis toward the centre of the vehicle longitudinally of the vehicle and at a higher level than the first axis, and releasable connecting means between the floor and the support means for holding the support means stationary in normal operation of the device and capable of being released in the event of an accident producing an impact capable of displacing the spare-wheel in a direction from said end toward said centre of the vehicle, the support having such position relative to the tank and the first axis and second axis being spaced apart a distance which is such that, upon release of the connecting means, the support means are capable of swinging about the second axis downwardly and toward the centre of the vehicle longitudinally of the vehicle to constrain the basket to move the spare-wheel toward a position under the tank.

4,060,271

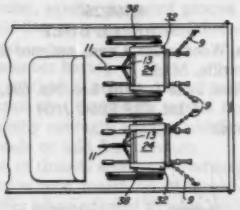
WHEELCHAIR HOLD DOWN ASSEMBLY

Joseph J. Williams, 4546 58th, San Diego, Calif. 92115

Filed Mar. 23, 1976, Ser. No. 669,951

Int. Cl.² B60N *1/02*; B60P *7/08*; B61D *45/00*; B62B *11/00*

U.S. Cl. 296—65 R **2 Claims**



1. A three point tie down arrangement to secure wheelchairs to a vehicle bed comprising: means securing said wheelchairs to said vehicle bed including; three eyebolts, each eyebolt attached to the bed of the vehicle by a backing plate and nut, the two front eyebolts being spaced apart a width to accommodate the width of a wheelchair, and the third eyebolt spaced rearwardly and equidistantly from each of the front two eyebolts a distance to accommodate the front to rear length of a wheelchair, link chains secured to the front eyebolts having an S-shaped hook at their respective free ends for attachment to the front side frame of the wheelchair at the juncture of the front vertical rod and lower horizontal rod of the chair, a third chain attached to the rear eyebolt, a flexible cross member adapted to extend transversely of the wheelchair beneath the seat thereof and attached to the rear side frame of the chair, an overcenter toggle chain tightener having a quick release attached to the flexible cross member and the last named chain and floating therebetween, so that pressure exerted on the fexible cross member and chain to tighten and secure the wheelchair to the bed causes the flexible cross member and chain to have a Y-shape.

4,060,272

WEATHERSTRIP

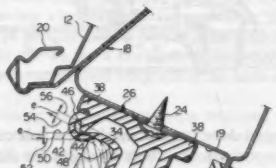
Kenichi Mori, No. 714, Nishiterao-cho, Kanagawa, Yokohama, Japan

Filed Feb. 3, 1976, Ser. No. 654,741

Claims priority, application Japan, Mar. 17, 1975, 50-35728[U]

Int. Cl.² B60J *1/17*

U.S. Cl. 296—93 **7 Claims**



1. A weatherstrip in a motor vehicle body structure having a roof rail defining an upper side of a window opening and a vehicle door having a window pane movable between raised and lowered positions relative to the window opening, comprising:

an elongated, resiliently deformable member extending along the roof rail and having an upper mounting portion secured to the roof rail;

an inboard lip portion on said member extending in use substantially downwardly from the upper mounting portion; an outboard lip portion on said member extending substantially downwardly from the upper mounting portion a transverse bridge portion opposed to said mounting portion and interconnecting the inboard lip portion and the outboard lip portion; the upper mounting portion, inboard lip portion, outboard lip portion and bridge portion defining the hollow of the resiliently deformable member; and restraining means integral with said member disposed within the hollow coactive with the upper mounting portion and the bridge portion to define a barrier to prevent the window pane from moving in a direction substantially normal to the plane of the window opening and corresponding to a direction outwardly of the vehicle body structure;

said restraining means comprising an internal projection portion of said elongated resiliently deformable member disposed internally of the hollow and thereinto and disposed outwardly of the outboard surface of the window pane when the vehicle door is closed with the window pane in a raised position, said internal projection portion being integral with said upper mounting portion but separate from said bridge portion.

4,060,273

VEHICLE BODY COVERING DEVICE

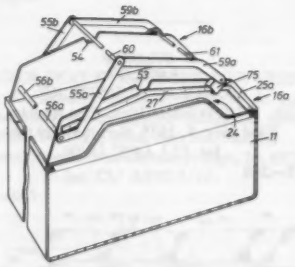
George Edgar Neville, Mansfield, England, assignor to George Neville Truck Equipment Limited, England

Filed Aug. 19, 1975, Ser. No. 605,940

Claims priority, application United Kingdom, Aug. 21, 1974, 28732/74

Int. Cl.² B60P 7/04

U.S. Cl. 296—100 **7 Claims**



1. A vehicle body covering device for attachment to an open-top vehicle body, said device comprising: a main frame, comprising first and second upstanding, longitudinally spaced, end walls and a longitudinally extending side member interconnecting said end walls at one side of said main frame, and defining an opening between said end walls and said side member through which the vehicle body can be loaded and unloaded; means for mounting the main frame on the vehicle body so that said interconnecting side member is disposed along one side of the vehicle body; a moveable support frame carried by said main frame and adapted to support a cover, said support frame comprising a pair of longitudinally spaced arms, means for mounting each arm adjacent a respective end wall for lateral movement in a path adjacent its respective end wall; means for moving said pair of longitudinally spaced arms of said support frame in said path between a first, covering position wherein a cover supported by said support frame extends across the full width of the vehicle body and covers said opening and a second, uncovering position wherein said longitudinally spaced arms and said cover carried thereby are disposed adjacent to said interconnecting side member so as to uncover said opening; said pair of longitudinally spaced arms of said support frame being positioned, in said covering position, with their outer ends adjacent the side of said main frame remote from said longitudinally extending side member and with their inner ends positioned, in said covering position, with their inner ends intermediate the sides of said main frame; a longitudinal connecting member interconnecting the outer ends of said pair of longitudinally spaced arms and moveable therewith; and a further longitudinal connecting member interconnecting said longitudinally spaced arms at a point intermediate the sides of said main frame and moveable therewith, said longitudinal connecting member and said further longitudinal connecting member being adapted to support a cover for said opening.

4,060,274

MOTOR VEHICLE ROOF

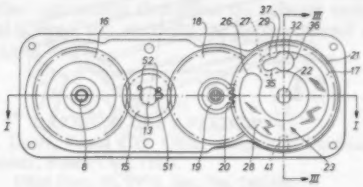
Horst Bienert, Gauting; Hans Jardin, Inning, and Walter Schätzler, Aufhausen, all of Germany, assignors to Webasto-Werk W. Baier GmbH & Co., Germany

Filed Nov. 22, 1976, Ser. No. 743,987

Claims priority, application Germany, Nov. 25, 1975, 2552773

Int. Cl.² B60J 7/02

U.S. Cl. 296—137 G **20 Claims**



1. Movable vehicle panel member apparatus comprising:

a vehicle panel member,

driving means for tiltingly and slidingly moving said panel member with respect to adjacent vehicle structure,

a movement control member engageable and movable with said driving means for limiting movement of said panel member as a function of the position of said movement control member,

and an abutment member engageable with said movement control member for limiting movement of said movement control member,

wherein said movement control member includes a first guide section which receives the abutment member during sliding movement of the panel member and a second guide section which receives the abutment member during tilting movement of the roof panel,

wherein said first and second guide sections overlap at an interconnecting passage permitting displacement of said abutment member between said guide sections when said panel member is in a predetermined intermediate position.

4,060,275

COLLAPSIBLE TABLE

M. James Hansen, 11348 SW. Ironwood Lp., Tigard, Oreg. 97223

Filed Sept. 21, 1976, Ser. No. 725,274

Int. Cl.² A47B 3/14

U.S. Cl. 297—159 **1 Claim**

1. In a table with foldable legs,

a table top means,

a first, second, third and fourth table leg means,

a first and second leg attachment means,

a first and second bench means,

a first and second bench securing means,

a first, second, third and fourth hinge means,

brace means,

a first and second cross member for securing a pair of said

legs in planar relationship, for supporting said bench means, and for receiving said brace means,

said first leg attachment means being secured to the underside of said top means at one end thereof,

said second leg attachment means being secured to the other end of said underside of said top means,

said first cross member secured to said first and said second leg means at a location determined by the desired height of said bench means and by the desired distance between said bench means and said table top means,

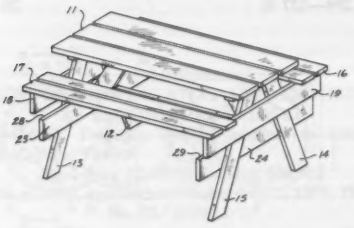
said second cross member secured to said third and fourth leg means at a location determined in the same manner as was said first assembly means,

said first and second leg means connected to said first leg attachment means by said first hinge means,

said third and fourth leg means connected to said second leg attachment means by said second hinge means,

said first bench securing means secured to one end of said pair of bench means,

said second bench securing means secured to the other end of said pair of bench means,



said bench securing means positioned inwardly of said top means edges so as to be confined by the underside of said top means and outwardly of said table leg means,

said bench means secured to said bench securing means to form a unitary structure, said bench means and said top means forming substantially a single plane when the table is in the stored position,

said brace means having a center brace means,

a pair of connecting board means,

a third and fourth hinge means,

said third and fourth hinge means secured to the bottom of said table top means and spaced from each other,

each of said connecting board means hinge connected at one end to one of said third and fourth hinge means and rigidly secured at the other end to said center brace means,

said connecting board means forming an acute angle with respect to said center brace means, and

said connecting means and said third and fourth hinge means permit said center brace means to lie parallel to the underside of said top means when stored and compressively to engage said cross members to position said table leg means against said bench securing means to provide rigidity to the set-up table.

4,060,276

COOLING SEAT

Robert A. Lindsay, 2105 Harrell Road, Orlando, Fla. 32807

Filed Nov. 22, 1976, Ser. No. 744,030

Int. Cl.² A47C *7/74*

U.S. Cl. 297—180 **9 Claims**

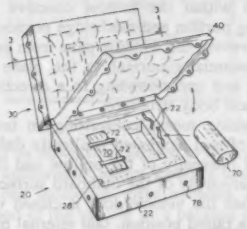
1. A portable seat cushion comprising in combination:

a seat section for detachably resting on a supporting surface, said seat section defined by a first base section having generally upstanding circumferential sides for forming an opening central void therein;

said seat section further including a first insert formed of an insulating material for removably coupling within said central void, said insert further including an open recessed cavity therein;

first coolant means comprising a container having a liquid therein for being frozen and then removably coupled within said recessed cavity for absorbing heat from adjacent said central void of said seat cushion;

first pad means coupled over said coolant means and said central void of said seat cushion for transferring heat



therethrough, said first pad means including a foraminous cover and a ventilated spacer means for spacing said foraminous cover from said first coolant means, whereby moisture forming on said first coolant means will not be exposed to the occupant of said cushion, and such that said seat section and the occupant are cooled by the transfer of heat through said first pad means into said first coolant means.

4,060,277

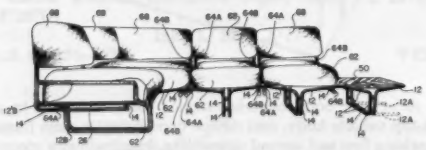
MODULAR FURNITURE

Roger K. Leib, 11740 Wilshire Blvd., Los Angeles, Calif. 90025

Filed Nov. 7, 1975, Ser. No. 629,898

Int. Cl.² A47C *13/00*

U.S. Cl. 297—248 **10 Claims**



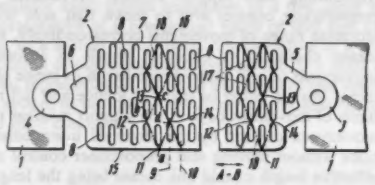
1. A modular multiple unit furniture assembly formed of a plurality of intercoupled modular pairs, each of said modular pairs comprising two modules individually formed of an elongated U-shaped tubular member bent about an intermediate axis to form a vertical section adjacent to the closed end of the U-shaped member and further to form a horizontal bent-over section adjacent to the open end of the U-shaped member, and a cross-bar extending across the open end of the U-shaped member and secured thereto, the vertical sections of the two modules forming each modular pair being positioned adjacent to one another to constitute legs for the assembly, and the bent-over horizontal section of each module being positioned adjacent to the horizontal bent-over section of one of the modules of an adjacent modular pair to constitute a seat support for the assembly; first fastening means intercoupling the vertical sections of the two modules forming the modular pair; and second fastening means intercoupling the horizontal sections of the two modules of the adjacent modular pairs.

4,060,278

ENERGY ABSORBING MEMBER

Bernhard Maeyerspeer, Stuttgart, Germany, assignor to Firma Porsche Design, Germany

Filed Nov. 7, 1975, Ser. No. 629,624
Claims priority, application Germany, Nov. 3, 1974, 2452336
Int. Cl.² A62B *35/00*
U.S. Cl. 297—386 9 Claims



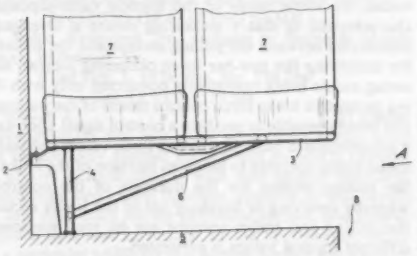
1. An energy absorbing arrangement comprising:
a safety belt means,
an energy absorbing band arranged in said safety belt means for absorbing energy resulting from an impact load on said safety belt means,
said band includes spaced lateral edges,
a plurality of slots provided in said band, said slots being disposed adjacent one another in a plurality of spaced parallel rows extending transversely to a loading direction of the energy absorbing band, and
means defining predetermined separation points on said energy absorbing band for dissipating energy resulting from an impact load including dimensioned strips of said energy absorbing band disposed between at least some of adjacent slots in at least one of said parallel rows and between at least one of said slots and one of said spaced lateral edges.

4,060,279

PASSENGER SEAT STRUCTURE FOR VEHICLES

Ignaz Vogel, Karlsruhe, Germany, assignor to Ignaz Vogel GmbH und Co. KG-Fahrzeugsitze, Karlsruhe, Germany

Filed Sept. 27, 1976, Ser. No. 726,618
Claims priority, application Germany, Sept. 25, 1975, 2542754
Int. Cl.² A47C *1/12*
U.S. Cl. 297—445 6 Claims



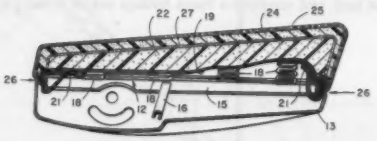
1. A passenger seat underframe structure for a vehicle having side walls and a floor, which includes in combination: a frame comprising a first section for receiving and supporting at least one seat with a back, a second section having one end connected to that one end portion of said first section which is to be placed near one side wall of the vehicle to be equipped with said seat structure, said second section having its other end arranged for connection directly with only the vehicle floor, and a third section forming reinforcing means having opposite end portions respectively connected to said first and second sections so as to form a cantilever triangle-shaped structure therewith.

4,060,280

FLAME-RESISTANT CUSHION

William Rudolph Van Loo, Grand Rapids, Mich., assignor to American Seating Company, Grand Rapids, Mich.

Filed July 8, 1976, Ser. No. 703,619
Int. Cl.² A47C *5/12, 7/18*
U.S. Cl. 297—452 4 Claims



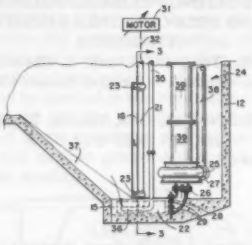
1. A flame-resistant cushion comprising a metal frame assembly; an inner core of foamed urethane material carried by said frame; and exterior layer of foamed neoprene material covering the entire exterior surface of the top, front, back and sides of said inner core; means for uniting said core and said exterior layer together substantially throughout the adjacent surfaces thereof and a metal pan enclosing the bottom thereof and attached to said frame.

4,060,281

COAL SLURRY FEEDER

Richard E. Doerr, Ponca City, Okla., assignor to Continental Oil Company, Ponca City, Okla.

Filed Nov. 10, 1976, Ser. No. 740,446
Int. Cl.² B65G *53/30*
U.S. Cl. 302—14 3 Claims



1. A feeder apparatus for transferring particulate material and water from a sump outlet to a pump inlet wherein said sump has sidewalls and a bottom; a well having sidewalls and a bottom formed in the bottom of said sump and having an outlet, and an inlet communicating with the bottom of said sump; means for moving said particulate materials from said sump into the inlet of said well; impeller means mounted in said well for moving said material from said well inlet to said well outlet; pump means having an inlet connected to the outlet of said well; and means for imparting a velocity to said water and particulate material, said velocity being sufficient to cause said particulate material to enter the inlet of said pump means.

4,060,282

HYDROSEPARATOR STACKER

Edwin A. Kehr, 260 W. Van Fleet, Apt. 29, Bartow, Fla. 33830

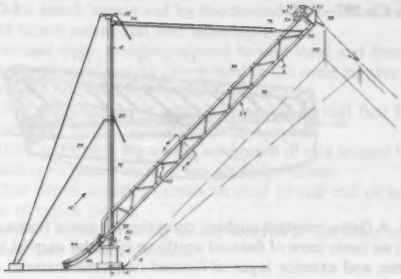
Filed Jan. 29, 1976, Ser. No. 653,389
Int. Cl.² B65G *53/30*
U.S. Cl. 302—16 12 Claims

1. An apparatus for movably supporting a separator of the

type which accepts an input slurry comprising a solid suspended in a liquid and removes a portion of the liquid therefrom to produce a slurry concentrate, said movable separator support comprising:

a vertical support having a vertical pivot axis therethrough;

a boom movably coupled to said vertical support, said boom having said separator attached thereto, said boom defined by a plurality of support elements including a first hollow support element operably coupled between a source of



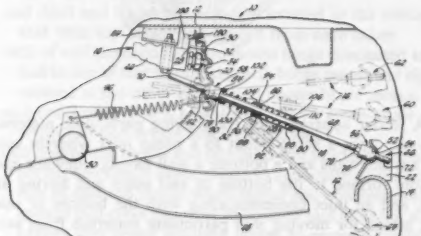
said slurry and an input of said separator for transporting said slurry thereto, said boom further including a second hollow support element operably coupled to said separator for removing said portion of said liquid therefrom, and said boom including a third support element connected to said first and second support elements and positioned substantially parallel thereto along the length of said boom, said first, second and third support elements disposed to define said boom as having a generally triangular cross-section.

4,060,283

BRAKE ACTUATING PRESSURE PROPORTIONING SYSTEM AND PROPORTIONER MODIFYING ARM THEREFOR

Michael Demido, Troy, and Ronald L. Shellhause, Vandalia, both of Ohio, assignors to General Motors Corporation, Detroit, Mich.

Filed Nov. 11, 1976, Ser. No. 740,794
Int. Cl.² B60T *8/18, 8/26*
U.S. Cl. 303—6 C **5 Claims**



3. In a vehicle having a load sensing proportioner, a vehicle sprung portion on which said proportioner is mounted, a vehicle unsprung portion including a support member having a range of movements relative to the vehicle sprung portion, the limits of said range of movements being defined by full jounce and full rebound limits of said vehicle unsprung portion, said range of movements including intermediate support member positions corresponding to vehicle curb weight as a light load and gross vehicle weight as a full load; the improvement comprising a linkage including:

a proportioner control arm movably mounted on said proportioner and having a range of movements the limits of which are defined by proportioner control requirements for vehicle curb weight and gross vehicle weight;

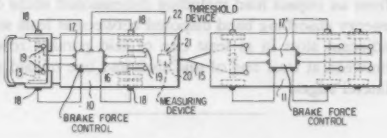
and link means connecting said proportioner control arm to said support member, said link means having a fixed effective length between said proportioner control arm and said support member during excursions of said support member within the portion of its range of movements defined by its aforesaid intermediate positions as limits and transmitting such support member movements to said proportioner control arm to move that arm within its aforesaid range of movements correspondingly, said link means changing its effective length to accommodate movements of said support member in its range of movements toward either of said full jounce and full rebound limits of movement beyond the support member range of movements defined by the aforesaid intermediate positions without moving said proportioner control arm, the effective length of said link means being the length from the connections of said link means to said proportioner control arm and said support member.

4,060,284

INSTALLATION FOR THE CONTROL OF THE BRAKE FORCE AT WHEELS OF MOTOR VEHICLES

Adolf Steiner, Baden-Baden, Germany, assignor to Daimler-Benz Aktiengesellschaft, Germany

Continuation of Ser. No. 597,177, July 18, 1975, abandoned.
This application Dec. 6, 1976, Ser. No. 747,724
Claims priority, application Germany, July 22, 1974, 2435115
Int. Cl.² B60T *8/02*
U.S. Cl. 303—100 **20 Claims**



1. An installation for the control of the brake force at wheels of interconnected motor vehicle combinations including a pulling section and a trailer section connected to the pulling section, which comprises one locking protective brake force control means each coordinated to the pulling section and to the trailer section, said brake force control means being operable to control the individual wheels of a respective section within the stable range of the friction value-slippage-curve, characterized in that a measuring means is arranged in the connection between the pulling section and the trailer section for measuring the tow-bar force occurring thereat, said measuring means being operatively connected only with the locking protective brake force control means of the pulling section and being operable to produce a control signal upon exceeding a predetermined pushing tow-bar force value, and said control signal being operable to block an increase of the brake force in the pulling section for the duration of the control signal, whereby swerving or breaking out of the trailer section when the pulling and trailer sections are on road surfaces having different friction values is prevented.

4,060,285

BRAKE CONTROL LOGIC CIRCUIT FOR VEHICLE SKID CONTROL BRAKE SYSTEM

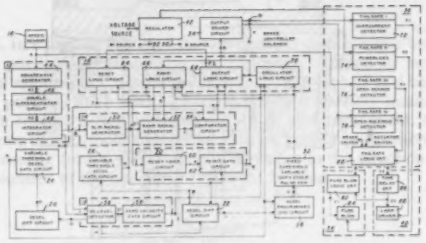
James J. Jones, Plano, Tex., assignor to Texas Instruments Incorporated, Dallas, Tex.

Division of Ser. No. 266,798, June 27, 1972, Pat. No. 3,982,793.
This application Aug. 6, 1976, Ser. No. 712,308
Int. Cl.² B60T *8/02*
U.S. Cl. 303—106 **7 Claims**

1. In an electronic control system of the type that monitors

a first condition of a mechanical system to provide an input to the electronic control system which generates in response thereto output control signals for selectively controlling the mechanical system, a brake control logic circuit for selectively generating an output logic signal from a plurality of input signals representative of other conditions of said mechanical system to enable generation of said output control signals, said brake control logic circuit comprising in combination:

an oscillator logic circuit responsive to a first input signal representative of a preselected value of said first condition, to a second input signal representative of a second condition of said mechanical system, and to a third input signal representative of a third condition of said mechanical system to provide an oscillator logic signal related to said third condition;



output logic circuit means connected to the output of said oscillator logic circuit, said output logic circuit means being responsive to said oscillator logic signal and to a fourth input signal representative of a selected relationship between said first condition and a fourth condition of said mechanical system to generate said output logic signal; and

ramp logic circuit means connected to the output of said oscillator logic circuit, said ramp logic circuit means being responsive to said first and third input signals, to said oscillator logic signal, and to a fifth input signal representative of a peselected value of said third condition for generating a hold signal and a slow signal indicative respectively of said second condition and said third condition.

4,060,286

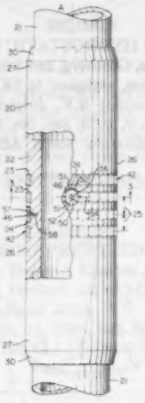
WEAR RESISTANT DRILL PIPE COLLAR AND METHOD OF MAKING SAME

Elvin G. Boice, Richmond, Va., assignor to Reynolds Metals Company, Richmond, Va.

Filed Oct. 1, 1976, Ser. No. 728,739
Int. Cl.[2] F16C *29/00*
U.S. Cl. 308—4 A **27 Claims**

1. A wear-resistant drill pipe collar comprising, a main body having a substantially annular groove and an access opening for said groove defined therein with said groove extending around said main body from opposite locations of said access opening, said main body having an outside surface, said groove being defined by a bottom surface having opposed end edges defining a particular width for said bottom surface and a pair of opposed side surfaces adjoining said end edges, said side surfaces having outer edges spaced apart a distance less than said width to thereby define said groove having a constricted substantially annular opening, a plurality of inserts made of a wear-resistant material disposed within said groove, each of said inserts being confined by said bottom surface and said side surfaces and having an outer portion extending between said constricted opening, each outer portion having a wear-resistant exposed surface which conforms to the configuration of said outside surface, each of said inserts being adapted to be inserted in and removed from said groove through said access opening, and a plug fixed to said main body within said access opening to prevent movement of said inserts within said annular groove and egress of said inserts from said access opening.

23. A method of making a wear-resistant drill pipe collar comprising the steps of, forming a substantially annular groove and an access opening for said groove in the main body of said collar radially inwardly from a cylindrical outside surface thereof and with said groove extending around said main body from opposite locations of said access opening, said groove being defined by a bottom surface having opposed end edges defining a particular width for said bottom surface and a pair of opposed side surfaces adjoining said end edges, said side surfaces having outer edges spaced apart a distance less than said



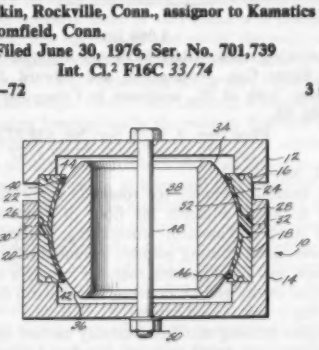
width to thereby define said groove having a constricted substantially annular opening, providing a plurality of inserts made of a wear-resistant material, disposing said inserts within said groove, each of said inserts being confined by said bottom surface and said side surfaces and having an outer portion extending between said constricted opening, each outer portion having a wear-resistant exposed surface which conforms to the configuration of said outside surface, each of said inserts being adapted to be inserted in and removed from said groove through said access opening, and fixing a plug to said main body within said access opening to prevent movement of said inserts within said annular groove and egress of said inserts from said access opening.

4,060,287

BEARING SEAL AND METHOD OF FORMING SAME

Stanley S. Orkin, Rockville, Conn., assignor to Kamatics Corporation, Bloomfield, Conn.

Filed June 30, 1976, Ser. No. 701,739
Int. Cl.[2] F16C *33/74*
U.S. Cl. 308—72 **3 Claims**



1. A bearing assembly comprising:

an outer bearing member having an inner surface,

an inner bearing member having an exterior surface shaped complementarily with respect to said inner surface of said

outer bearing member, said inner and outer bearing members being movable relative to one another,

sealing members disposed between and in contact with said inner surface of said outer bearing member and said exterior surface of said inner bearing member,

said inner surface of said outer bearing member having means for retaining said sealing members in place, said retaining means including a bearing surface coating on said interior surface, said coating comprising a cured mixtue of an acrylate composition and a particulate solid lubricant which is adhered to at least a portion of said sealing members.

4,060,288

SUPPORT IN HYDROSTATIC BEARINGS

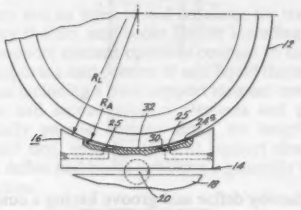
Torsten Henry Arsenius, Goteborg, and Sven Christian Bildtsén, Lerum, both of Sweden, assignors to SKF Industrial Trading and Development Company B.V., Jutphaas, Netherlands

Filed Apr. 9, 1976, Ser. No. 676,309

Claims priority, application South Africa, Apr. 23, 1975, 75/2286

Int. Cl.² F16C *17/06*

U.S. Cl. 308—73 **4 Claims**



1. In a hydrostatic bearing for rotatably supporting therein a member comprising a shoe having an arcuate first surface confronting the member and having formed therein a pocket for a fluid under pressure, the first surface and said member being of a predetermined relative configuration to provide essentially a line contact between said member and the surface of said shoe at diametrically opposed locations in said arcuate first surface, the improvement comprising means defining a projection in said pocket having a second surface confronting the member of generally the same contour as said first surface to provide an additional essentially line contact between said member and said second surface generally aligned with the line contact between said member and said arcuate first surface and disposed approximately midway therebetween.

4,060,289

BEARING ASSEMBLY FOR AN AUGER SCRAPER

James Edgar Gee, Washington, and Edward Joseph Ohms, Decatur, both of Ill., assignors to Caterpillar Tractor Co., Peoria, Ill.

Filed Nov. 3, 1975, Ser. No. 628,022

Int. Cl.² F16C *19/38;* E02F *3/62*

U.S. Cl. 308—187.1 **12 Claims**

1. A bearing assembly for rotatably supporting the lower end of an auger adjacent the floor of a self-loading auger scraper bowl, said assembly comprising, in combination:

a lower, fixed housing member mounted adjacent the bowl floor, said fixed housing member having a stepped cylindrical cavity and an external, annular top flange;

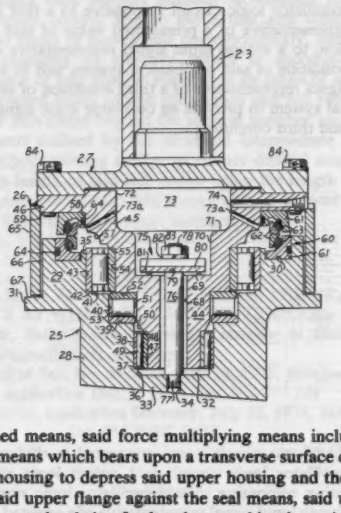
bearing means in said cavity;

an upper housing member rotatably carried on said bearing means, said upper housing member having an external annular upper flange confronting said top flange;

means surmounting said upper housing which is adapted to receive the lower end of an auger shaft;

annular lubricant seal means mounted between said annular flanges, said seal means including elastomeric ring means which must be compressed to make said seal means effective;

and means for preloading said upper housing member to compress said elastomeric ring means, said preloading means comprising fixed means secured to the lower housing member, and force-multiplying means engageable with



said fixed means, said force multiplying means including flange means which bears upon a transverse surface of the upper housing to depress said upper housing and thereby force said upper flange against the seal means, said upper housing member being further depressed by the weight of the auger to separate said transverse surface from said flange means.

4,060,290

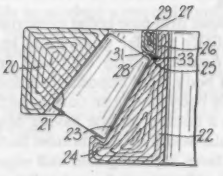
BEARING COMPONENT AND METHOD OF MAKING SAME

Thomas Scott Brawley, 152 Green Countrie Court, 7841 Ridge Ave., Philadelphia, Pa. 19128

Continuation-in-part of Ser. No. 456,139, March 29, 1974, Pat. No. 3,960,419. This application May 28, 1976, Ser. No. 691,083

Int. Cl.² F16C *33/58*

U.S. Cl. 308—216 **12 Claims**

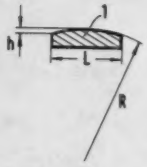


1. A channel-anti-friction bearing component comprising a generally cylindrical body portion, a frusto-conic inwardly facing bearing surface on said body portion constituting the main bearing surface of the outer ring of a tapered bearing and an integrally formed rib having a surface defining the larger end of the channel, the metal flow in said body and said integrally formed rib running in directions which lie substantially parallel to the corresponding sides of the axial cross-section of the channel.

4,060,291
FRICTION BEARING

Rolf Seybold, Eichenstrasse 21a, 5650 Solingen, Germany

Filed July 6, 1976, Ser. No. 702,616
Claims priority, application Germany, July 8, 1975, 2530472
Int. Cl.² F16C 17/10
U.S. Cl. 308—241 15 Claims

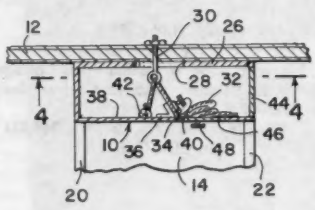


1. In a friction bearing having a plurality of projecting bearing portions for supporting a component intended to move over said bearing, the improvement wherein each of said bearing portions has a bearing surface which is variably inclined with respect to the adjacent surface of said component, the degree of such inclination of the bearing surface progressively decreasing from a maximum to a minimum in the direction of movement of the component over the bearing.

4,060,292
STORAGE BOX

Carmen Medina, P.O. Box 431, New York, N.Y. 10023

Filed July 19, 1976, Ser. No. 706,146
Int. Cl.² A47F 5/08
U.S. Cl. 312—247 5 Claims



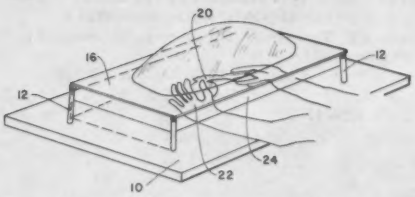
1. A storage box construction comprising:
a substantially rectangular container in mating engagement with vertical guide rails mounted on opposed side walls of an enclosed space having a ceiling and a floor,
a door mounted on said container providing access to the interior of said container, and
means for raising and lowering said container from a position adjacent said ceiling to a position adjacent said floor, said means including an eyebolt extending through an aperture located in a top surface of said container, said eyebolt connected to said ceiling, a ring on the bottom interior surface of said container, a bracket on the bottom interior surface of said container, a clamp mounted on said bracket, and a rope connected to said ring and threaded in sequence through said eyebolt, and said clamp, said rope selectively threadable through the opening in which said door is mounted.

4,060,293
PROTECTIVE DEVICE

Irene Walters, 780 Barry Place, Uniondale, N.Y. 11553

Filed Apr. 14, 1976, Ser. No. 677,045
Int. Cl.² A47B 81/00; A61G 11/00; A47B 97/00; A47G 19/26
U.S. Cl. 312—284 5 Claims

1. A protective device especially adapted for use when working with sensory irritating foodstuff items, comprising a cover member having a substantially centrally disposed transparent bubble portion and at least two support members disposed substantially perpendicular to said cover member and integral therewith, said at least two support members pivotably secured to said cover member, said support members pivot

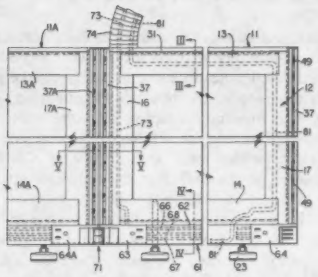


between substantially vertical use and horizontal storage positions relative to said cover member, whereby said support members when in said substantially vertical use position provide vertical support of said cover member above a work surface for said sensory irritating items.

4,060,294
WALL PANEL WITH PREWIRED POWER SYSTEM

Richard G. Haworth, Holland; Charles J. Saylor, Zeeland, and Harold R. Wilson, Holland, all of Mich., assignors to Haworth Mfg., Inc., Holland, Mich.

Filed Sept. 22, 1975, Ser. No. 615,506
Int. Cl.² H01R 39/00
U.S. Cl. 339—4 46 Claims



1. In a portable, prefabricated wall panel positionable in a vertical upright position and having a frame and panel means secured to the opposite sides of said frame and defining the exterior vertical side surfaces of said panel, the improvement comprising elongated channel means fixedly secured to said panel, said channel means extending across said panel between a pair of opposed edges thereof and defining a closed interior passage extending longitudinally therealong, first and second electrical terminals fixedly mounted on said panel adjacent the opposite ends of said channel means and disposed adjacent the opposed edges of said panel, at least said first electrical terminal including a pair of first multiple-hole electrical sockets formed therein, one of the pair of first sockets being on one side of the panel and the other being on the other side of the panel, said first sockets each being adapted to receive a conventional two or three-pronged electrical plug therein, said first and second terminals each including a pair of second electrical sockets formed therein, one of the pair of second sockets being on one side of the panel and the other being on the other side of the panel, said second sockets each defining a plug receptacle having a different geometrical configuration from the plug receptacle defined by each of said first sockets so that the plugs which mate with said second sockets will not mate with said first sockets, and electrical cable means extending along said

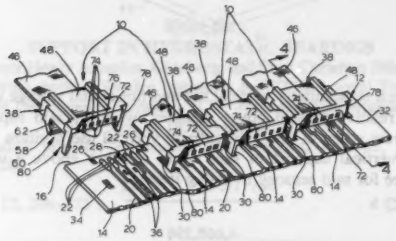
passage and interconnected to said first and second terminals for transmitting electrical energy therebetween.

4,060,295

ZERO INSERTION FORCE PRINTED CIRCUIT BOARD EDGE CONNECTOR ASSEMBLY

Thaddeus K. Tomkiewicz, Bolingbrook, Ill., assignor to Molex Incorporated, Lisle, Ill.

Filed Mar. 15, 1976, Ser. No. 666,769
Int. Cl.² H05K *1/12*
U.S. Cl. 339—17 LC **1 Claim**



1. A circuit assembly comprising:

a printed circuit board including an edge and a plurality of adjacent connector mounting areas at and near said edge, each connector mounting area having a top surface with a group of connection tabs arranged along the edge, a bottom surface, and aperture means spaced from the edge; and

a plurality of connector assemblies each mounted on a connector mounting area, each connector assembly including an insulated housing and a plurality of like spring terminals mounted in the housing for engaging a connection tab, said housing including an edge receiving slot for receiving the edge of the board therein, said board being rotatable within said edge receiving slot from a non-engaging position wherein the terminals are spaced from the connection tabs to a mounted position wherein the contact portions are engaging the connection tabs, and two hook means formed on the overlying portion of the connector assembly for penetrating the aperture means and engaging the bottom surface of the respective connector mounting area for holding the board in the mounted position, said hook means being staggered so that the hook means on one connector assembly and the hook means on an adjacent connector assembly can be linearly aligned so that both hook means can be mounted in the same aperture means.

4,060,296

LOW PROFILE DIP RECEPTACLE

James Raymond Kunkle, Enola, and Billy Erik Olsson, New Cumberland, both of Pa., assignors to AMP Incorporated, Harrisburg, Pa.

Filed Oct. 26, 1976, Ser. No. 735,232
Int. Cl.² H05K *1/12*; H01R *5/04, 13/50*
U.S. Cl. 339—17 CF **15 Claims**

15. A low profile DIP socket comprising:

housing means having at least one major surface with at least one contact retaining cavity formed in said major surface;

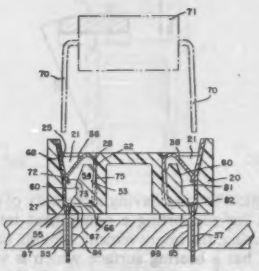
said cavity having side walls and a bottom with an aperture through said bottom and further comprising a rib-like element extending into said cavity from a first of said side walls;

contact means retained in said at least one cavity and comprising:

a generally U-shaped configuration having first and second legs with a transverse element joining together said legs;

a first of said legs having a extension thereon which is bent back downwardly into the channel of said "U" and towards and adjacent said second leg; and

a tab sheared from the center portion of said transverse element and said first leg and extending downwardly



from said second leg through said aperture in said bottom of said at least one cavity and leaving a slot in the center portion of said transverse element and said leg;

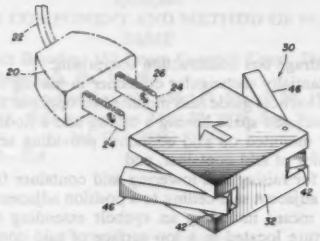
said contact means being frictionally retained in said at least one cavity with said transverse element positioned near said bottom of said cavity and the rib of said cavity extending through the slot in said contact means.

4,060,297

PLUG CAP

Bruce H. Marshall, 2256 W. Arthur Ave., Chicago, Ill. 60645, and Henry E. Blenner, 1515 E. Central Road, Arlington Heights, Ill. 60005

Filed Nov. 29, 1976, Ser. No. 745,531
Int. Cl.² H01R *13/44*
U.S. Cl. 339—37 **13 Claims**



1. A plug cap for use in association with a male electrical plug having two spaced-apart prongs, respectively with apertures near the ends thereof, said plug cap comprising a body having a pair of spaced-apart channels therein respectively to receive the prongs of the male electrical plug, said body further having therein a pair of outwardly facing, oppositely directed recesses, a pair of legs pivotally mounted on said body and movable between a locking position respectively in said recesses and respectively alongside said channels and an unlocking position respectively out of said recesses and respectively away from said channels, and a pair of fingers respectively carried by said legs and located thereon respectively to enter the apertures of the prongs when the legs are in the locking positions thereof and to be withdrawn from the apertures when the legs are in the unlocking positions thereof.

4,060,298

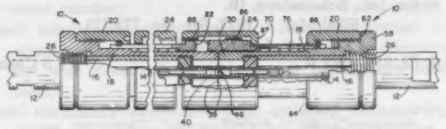
HERMAPHRODITIC CONNECTOR ASSEMBLY

John M. Gearin, Brookfield, Conn., assignor to Bunker Ramo Corporation, Oak Brook, Ill.

Continuation of Ser. No. 531,912, Dec. 12, 1974, abandoned. This application Apr. 12, 1976, Ser. No. 675,666

Int. Cl.² H01R *25/10*

U.S. Cl. 339—48 **7 Claims**



1. A hermaphroditic connector assembly arrangement for use with a pair of airlines each having an outer conductor including an end face and an inner conductor including a spring biased contact having an end face with each end face adapted to engage a respective other end face along a common radial plane to complete an electrical connection between the outer conductors and another electrical connection between the inner conductors comprising:

a tubular body for each airline with each body having a front end forming the end face for the respective outer conductor adjacent the respective spring biased contact end face and means for securing the respective body to the respective outer conductor,

a registration ring carried on each body for axial movement on the respective tubular body and having a plurality of spaced teeth projecting axially in one direction,

means for biasing said ring in said one direction for positioning the teeth of each ring in overlapping engagement with the tubular body secured to the outer conductor of the other airline to align each end face in said common plane

means on each body and ring for enabling rotation of each ring on the respective body to a predetermined position for circumferentially aligning the teeth on each ring with the spaces on the other ring for enabling the positioning of the teeth on each ring in overlapping engagement with the tubular body secured to the outer conductor of the other airline and for axially aligning all of said end faces with each ring thereafter held against rotation relative each body and a coupling nut having means engaging one ring and threadingly engaging the other of said rings in response to rotation in one direction for moving said rings axially towards each other and for securing said airlines to each other.

4,060,299

ELECTRICAL CONNECTOR

Robert A. Williams, 55 Bounty Road East, Fort Worth, Tex. 76116

Filed July 8, 1976, Ser. No. 703,622

Int. Cl.² H01R *13/54*

U.S. Cl. 339—48 **10 Claims**

1. An electrical connector for connecting two leads together, comprising:

a housing having a cylindrical opening formed therethrough,

electrical insulating cylindrical means located in said opening,

said electrical insulating cylindrical means being separate from said housing and removable from said opening,

said electrical insulating cylindrical means having an opening formed therethrough,

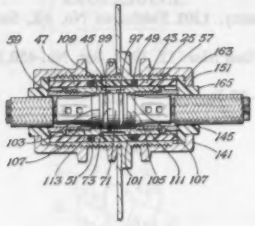
a metallic cylinder located in the opening of said insulating cylindrical means and having threads formed in its inside wall at opposite ends thereof,

said metallic cylinder having an opening formed therethrough and having two contacts received through its opposite ends, each contact adapted to have an electrical lead connected thereto,

said two contacts having shoulders extending outwardly therefrom,

two holding means adapted to be fitted around said contacts and having threads formed on their outer surfaces and adapted to be threaded into opposite ends of said metallic cylinder for applying a holding force to said shoulders of said contacts for holding said contacts in said metallic cylinder,

said housing having threads formed on its outer surface at opposite ends thereof, and



two cup-shaped end caps, each having an inside cylindrical wall with threads formed therein, a first end with a large opening, and a rear wall at an opposite end with a small opening formed therethrough,

said small opening of each end cap having a diameter less than the outside diameter of the ends of said housing and of a size sufficient to receive one of said leads,

the size of said large opening of each end cap being sufficient to allow each end cap to be fitted around and threaded to one end of said housing.

4,060,300

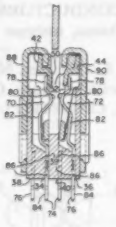
LONGITUDINALLY ACTUATED ZERO FORCE CONNECTOR

Max L. Jayne, North Warren, and Paul R. Natale, Warren, both of Pa., assignors to GTE Sylvania Incorporated, Stamford, Conn.

Filed Jan. 31, 1977, Ser. No. 764,278

Int. Cl.² H05K *1/07*

U.S. Cl. 339—74 R **10 Claims**



1. A longitudinally actuated connector comprising:

a hollow support member comprising two longitudinally extending side walls, each having at least one lug which protrudes from the exterior surface thereof;

at least two opposing contact holders positioned within said support member and comprising opposing surfaces which include opposing cam surfaces having at least one high point and at least one low point;

at least one resilient electrical contact engaging each of said holders to form a pair of opposing contacts; and,

at least two actuator plates having apertures therein through which said lugs extend to movably affix said plates to the

exterior surfaces of said support member each of said plates including at least one cam follower which extends into said support member and engages one of said cam surfaces such that movement of said plates which causes said cam followers to engage said high points forces said opposing contacts apart and movement of said plates which causes said cam followers to engage said low points allows said opposing contacts to move towards each other.

4,060,301

ELECTRICAL CONNECTOR FOR TRANSMISSION LINE INSULATORS

Albert W. Beatty, 1201 Fairhaven No. 6K, Santa Ana, Calif. 92701

Filed Mar. 12, 1974, Ser. No. 450,287
Int. Cl.² H01R *7/04*
U.S. Cl. 339—95 R **13 Claims**

1. An electrically conductive clip for providing an electrical path between metal components of transmission line insulators, said clip comprising:

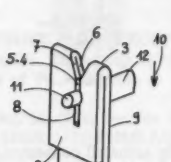
a resilient, electrically conductive member comprising a U-shaped sheet deformed from its central plane so that it extends outwardly in both directions from its central plane and having two arms forming an inner passage way, said member having at least one sharp contact finger protruding outwardly away from said plane in a first direction and at least two protrusions extending outwardly away from said plane in the opposite direction, at least one of said protrusions having a sharp extremity with sufficient hardness to penetrate corrosive and insulative formations on the metallic components.

4,060,302

CONNECTOR ADAPTED TO GRIP ELECTRIC CONDUCTORS

Yves Saligny, Cluses, France, assignor to Etablissements Carpano & Pons, France

Filed Oct. 8, 1976, Ser. No. 731,011
Claims priority, application France, Oct. 27, 1975, 75.33486
Int. Cl.² H01R *13/38*
U.S. Cl. 339—97 R **10 Claims**



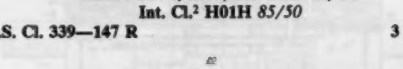
1. A connector for the connection of electrical conductors of relatively small cross-section, of the type comprising a flat conducting element in which there is a gripping slot of relatively small width in relation to the thickness of the flat element, said slot being dimensioned to receive and grip at least one conductor, wherein the flat element is formed of two flat pieces disposed in piled configuration against one another and rigidly connected to one another, each piece having a narrow slot which is not substantially wider than the thickness of the piece, said narrow slots of the flat pieces being aligned to form the gripping slot of the flat element.

4,060,303

FUSED IN-LINE POWER CONNECTOR ARRANGEMENT

Mieczyslaw Wilczynski, Fort Lauderdale, Fla., assignor to Motorola, Inc., Schaumburg, Ill.

Filed Mar. 2, 1977, Ser. No. 773,721
Int. Cl.² H01H *85/50*
U.S. Cl. 339—147 R **3 Claims**



1. An improved power connector arrangement with self-contained in-line fusing device, comprising in combination:

a pair of substantially identical connector elements for interfitting each with the other, each of said connector elements having a forward reduced portion and a pair of laterally displaced but longitudinally extending openings therein, one of said openings being capable of retaining a glass tube fuse device therein and the other of said openings being capable of retaining respective portions of a jack assembly, said connector elements further including a pair of up-raised projections on the surfaces thereof; and

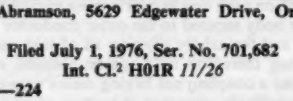
a split-ring retainer member having a pair of slots at one end thereof for overfitting and capturing said projections on one of said connector elements, said retainer having a pair of L-shaped openings at the other end thereof for permitting the insertion of said projection of said other connector element and the rotation thereof laterally to effect a locking action.

4,060,304

BATTERY CABLES AND PROCESS FOR MAKING SAME

Joseph O. Abramson, 5629 Edgewater Drive, Orlando, Fla. 32810

Filed July 1, 1976, Ser. No. 701,682
Int. Cl.² H01R *11/26*
U.S. Cl. 339—224 **11 Claims**



1. An improved battery cable, comprising:

an elongated electrically conductive cable formed by a multiplicity of wire strands;

a terminal member adapted to connect said electrically conductive cable to a projecting post of a storage battery;

said terminal member including a body having a forward portion and a rear portion;

said forward portion having a pair of forwardly extending arms which circumscribe and define an opening into which said projecting battery cable post can extend;

a tubular engagement member connecting said terminal member with said electrically conductive cable;

said tubular engagement member having a forward end and a rear end;

said tubular engagement member having a forward portion thereof, including said forward end, embedded within said

rear portion of said terminal member, with the remainder of said tubular engagement member projecting beyond said terminal member rear portion;

said projecting portion of said tubular engagement member being cylindrical and said embedded forward end thereof being flattened and having a width in excess of the diameter of said cylindrical projecting portion;

said electrically conductive cable having one end thereof inserted into the projecting portion of said tubular engagement member;

said tubular engagement member being compressed inwardly along the projecting portion thereof to compress the wire strands therewithin into a substantially solid mass;

said electrically conductive cable including an insulating sheath surrounding said multiplicity of wire strands;

said insulating sheath at said one end of said electrically conductive cable terminating substantially at said rear end of said tubular engagement member to assure that said wire strands are unexposed; and

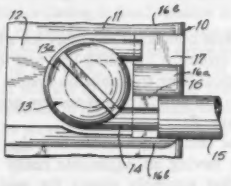
a protective plastic tube extending along at least part of said tubular engagement member projecting portion and said insulating sheath and being heat shrunk into intimate contact therewith.

4,060,305

LOOP FORMING GAUGE AND METHOD OF FORMING A LOOP

John M. Poliak, East Meadow; Juan M. Lopez, and Robert W. Gritz, both of New York, all of N.Y., assignors to Leviton Manufacturing Co., Inc., Little Neck, N.Y.

Filed Apr. 30, 1976, Ser. No. 682,082
Int. Cl.[2] H01R 9/10, 43/00
U.S. Cl. 339—269 **5 Claims**



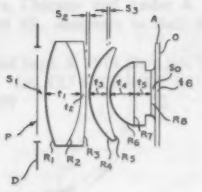
1. In an electrical wiring device, the improvement comprising: a base of rigid insulating material; a terminal plate mounted on said base; a binding screw threadably carried by said plate; wire-restraints formed on said base in spaced relation to said binding screw; said wire-restraints including projections defining open passageways communicating with opposite sides of said binding screw; a strip gauge formed on said base for measuring a length of insulated conductor wire for removal of insulation therefrom and a loop forming gauge formed in said base for receiving and bending the said length of conductor wire into a loop for engagement with said binding screw with insulation on the wire extending into one of said wire-restraint passageways, said loop forming gauge comprising a cavity formed within a base of substantially rigid insulating material and of a predetermined configuration; the configuration of said cavity being defined by substantially straight base wall portions communicating with stepped termination portions thereof, said stepped termination portions comprising means for accepting wires of more than one diameter, and a base surface with shoulder portions thereof extending in a substantially arcuate path in communication with said steped termination portions, thereby providing means for guiding and forming an arucate wire configuration.

4,060,306

ACHROMATIC APLANATIC CONDENSER

Krishnaiyer Swaminathan, Williamsville, N.Y., assignor to American Optical Corporation, Southbridge, Mass.

Filed Dec. 16, 1974, Ser. No. 532,988
Int. Cl.[2] G02B 21/08
U.S. Cl. 350—87 **1 Claim**



I II III

1. An achromatic aplanatic condenser having a numerical aperture of 1.30 which is well corrected for spherical and chromatic aberrations and capable of uniformly filling a field of about 2.4mm in diameter which comprises, a double convex doublet consisting of a double convex singlet cemented to a concavo-convex singlet as the first component, a meniscus lens as the second component and a convex plano doublet as the third component all being aligned along an optical axis and having a front pupil plane external to said condenser, having the following parameters:

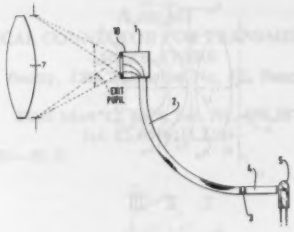
Lens	Radius	Thickness	Space	Refractive Index	Abbe No.
			S_1= 1.526		
	R_1= 38.54				
		T_1= 8.73		ND_1= 1.6203	γ_1= 60.3
I	R_2= 24.33				
		T_2= 1.50		ND_2= 1.786	γ_2= 25.5
	R_3= −169.084				
			S_2= 0.10		
	R_4= 13.48				
II		T_3= 4.77		ND_3= 1.6203	γ_3= 60.3
	R_5= 32.96				
			S_3= 0.10		
	R_6= 7.77				
		T_4= 6.13		ND_4= 1.651	γ_4= 55.8
III	R_7= ∞				
		T_5= 4.12		ND_5= 1.786	γ_5= 25.5
	R_8= ∞				

wherein the values for radii, thicknesses, and air spaces are in mm and the refractive indices and Abbe numbers are absolute values.

4,060,307
FACE PLATE GRATICULE

David George Anthony Demaine, and David Gordon Norrie, both of Leeds, England, assignors to The Rank Organisation Limited, London, England

Filed Apr. 30, 1976, Ser. No. 682,131
Claims priority, application United Kingdom, Apr. 30, 1975, 17972/75
Int. Cl.² G02B 5/16; G08B 5/00; G02B 23/10
U.S. Cl. 350—96 B 6 Claims

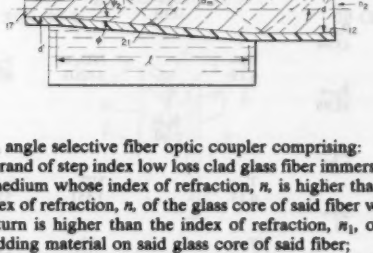


1. In an optical system having a stand-by sight device comprising a flexible fibre optic bundle, a light input unit at one end of the bundle, a fibre distributing element at the other end of the bundle, and a graticule on the output face of the distributing element, and a lens unit through which an image of the graticule is projected via a combining mirror into the user's field of view, the improvement that the distributing element has a face plate having an outer face with which the output ends of the fibres are coplanar and on which is deposited a dark ground graticule, the face plate bearing the graticule and the flexible fibre optic bundle having a numerical aperture sufficiently large to cover the maximum acceptance angle of the lens unit.

4,060,308
ANGLE SELECTIVE COUPLER FOR OPTICAL FIBERS

Michael K. Barnoski, and Viktor Evtuhov, both of Pacific Palisades, Calif., assignors to Hughes Aircraft Company, Culver City, Calif.

Filed Aug. 4, 1975, Ser. No. 601,863
Int. Cl.² G02B 5/14
U.S. Cl. 350—96 C 5 Claims

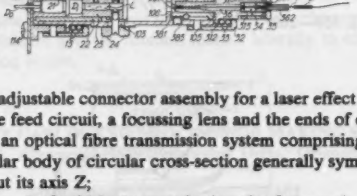


1. An angle selective fiber optic coupler comprising:
a. a strand of step index low loss clad glass fiber immersed in a medium whose index of refraction, n_s is higher than the index of refraction, n_c of the glass core of said fiber which in turn is higher than the index of refraction, n_1, of the cladding material on said glass core of said fiber;
b. excitation means comprising a modified section of said strand of glass fiber having a tapered core portion with a gradually decreasing thickness along the length thereof for receiving optical energy, said core portion thickness adapted to allow excitation of any one or more of a plurality of orders of modes of optical propagation, each mode being defined by a predetermined angle of propagation relative to the direction of the longitudinal axis of said core of said glass fiber strand measured at a point beyond said modified section; and,
c. means for impinging a beam of optical radiation through said medium of index n_s and through said modified section and into said core of said strand of glass fiber, the impingement angle of said beam of the cladding of said modified section being preselected to produce said predetermined mode angle of propagation after said beam has traversed said modified section by undergoing one or more total internal reflections therein.

4,060,309
ADJUSTABLE CONNECTOR ASSEMBLY FOR LASER EFFECT DIODE, FOCUSSING LENS AND AN OPTICAL FIBRE IN OPTICAL FIBRE TRANSMISSION SYSTEM

Georges E. Le Noane, Kerrougant Bras, Tregastel, France (22730), and André M. Mathern, Route du Rusquet Brelevenez, Lannion, France (22300)

Filed May 24, 1976, Ser. No. 689,122
Claims priority, application France, May 27, 1975, 75.16470
Int. Cl.² G02B 5/16
U.S. Cl. 350—96 C 4 Claims

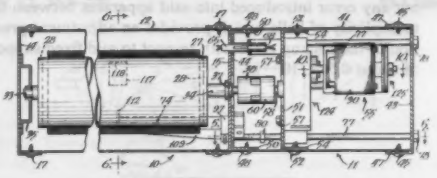


1. An adjustable connector assembly for a laser effect diode, the diode feed circuit, a focussing lens and the ends of optical fibres in an optical fibre transmission system comprising:
a tubular body of circular cross-section generally symetrical about its axis Z;
a first end of said body constituting the front end of said connector having an adjustable ready lock and unlock diode socket assembly means for said diode and feed circuit and a socket means for the focussing lens, said adjustable diode socket assembly means including first adjustment means to vary the distance along the axis of said tubular body between said diode and said lens;
the other end of said tubular body constituting the back end of said connector having a fibre ends ready lock and unlock socket means for moving the fibre ends in a transverse direction along the *xy* directions relative to the axis Z of said tubular body in a plane perpendicular to said axis, said perpendicular plane passing by the focus seen through said lens of a luminous beam emitted by said diode;
said diode socket assembly means comprising a first socket for the diode frictionally secured in a second socket and thereby secured in a predetermined location in said front end of said connector;
said socket means for said focussing lens constituting a third socket which slidably fits into said second socket;
said first adjustment means comprising radial fingers which are threadedly engaged in said third socket to adjustably position said lens by screw movement; and,
guide means for said radial fingers constituting slots in said tubular body to guide the displacement of said lens relative to each diode and nuts on said tubular body for manipulation of said first adjustment means.

4,060,310
DETACHABLE MODULAR DRIVE UNIT FOR PROJECTION SCREEN APPARATUS

Donald J. Brown, Naperville, Ill., assignor to Knox Manufacturing Co., Wood Dale, Ill.

Filed Jan. 6, 1976, Ser. No. 646,922
Int. Cl.² G03B 21/56; E06B 9/20
U.S. Cl. 350—117 7 Claims

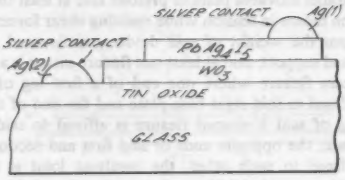


1. A projection screen adapted to be mounted on a supporting surface, comprising: a modular screen unit including an elongate screen casing having a longitudinal slot extending between its opposite ends, an elongate roller within said casing and having one of its opposite end positions exposed at one end of the screen casing, spaced bearings for rotatably supporting the opposite end portions of the roller within said casing, support means for securing said casing to the supporting surface, and a flexible screen having a transverse marginal edge portion secured to said rotatable roller, said screen being wound upon the roller when in closed position and being unwound from said roller when in exposed operative position so as to extend through said slot; a modular motor unit extending cantileverwise outwardly from said one end of said screen casing, said modular motor unit including a motor casing, and an electric drive unit within said motor casing having control means for rotating said roller to move said screen to exposed operative position and to closed position, the drive unit including a rotatable shaft with a free end portion positioned at one end of said motor casing; means for releasably securing said one end of said motor casing in fixed relation to said one end of the screen casing of the modular screen unit so as to position said free end portion of the shaft of the drive unit adjacent said one end portion of the roller; and means for releasably coupling the free end portion of the rotatable shaft with said one end portion of the roller to impart rotation from the shaft to the roller to move the screen between exposed operative position and closed position.

4,060,311
ELECTROCHROMIC DEVICE

Mino Green, London, England, assignor to Imperial Chemical Industries Limited, London, England

Filed Jan. 8, 1976, Ser. No. 647,440
Claims priority, application United Kingdom, Jan. 10, 1975, 1168/75
Int. Cl.² G02F 1/16
U.S. Cl. 350—160 R 11 Claims

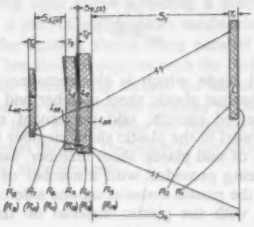


1. An electrochromic device comprising a first electrode, a metal-sensitive compound in contact with the first electrode and with a solid fast ion conductor in which fast ion conductor the fast ion is an ion of a metal which dissolves in the metal sensitive compound to change the colour thereof, the fast ion conductor itself being in contact with a second electrode capable of providing ions the same as the fast ions of the conductor.

4,060,312
COPIER LENS OF REFLEX DESIGN

Walter R. Linke, Chicago, and Andor A. Fleischman, Northbrook, both of Ill., assignors to Bell & Howell Company, Chicago, Ill.

Filed Sept. 3, 1976, Ser. No. 720,482
Int. Cl.² G02B 3/04, 17/08
U.S. Cl. 350—189 1 Claim



1. An optical system of a reflex copier lens including a combination of glass and plastic elements, at least one of the elements being plastic and having aspheric surfaces, the system having substantially the following specifications:

EFL = 7.4388 inches (188.94mm)
Half Angle of Field = 25.92 degrees
Aperture = f/5.02 (All dimensions in Inches)

Lens	Radii	Thickness	Spacing	N_D	V
L_1	R_1 = INF. R_2 = INF.	T_1 = .2350		1.522	59.5
			S_1 = .0100		
L_2	R_3 = +13.3610	T_2 = .3090		1.755	27.6
	R_4 = − 8.0685		S_2 = .0230		
L_3	*R_5 = + 4.10036	T_3 = .3240		1.490	57.4
	*R_6 = − 4.01434		S_3 = .8560		
L_4	R_7 = + 9.4050	T_4 = .1660		1.589	61.3
	R_8 = +39.1650		—		
L_{4R}	R_9 = +39.1650	T_5 = .1660		1.589	61.3
	R_{10} = + 9.4050		S_4 = .8560		
L_{3R}	*R_{11} = −4.01434	T_6 = .3240		1.490	57.4
	*R_{12} = +4.10036		S_5 = .0230		
L_{2R}	R_{13} = − 8.0685	T_7 = .3090		1.755	27.6
	R_{14} = +13.3610		S_6 = 13.5345		

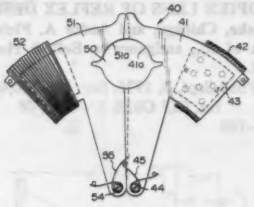
wherein the first column lists the lens elements numerically, the second column lists the respective radii and vertex radii of the aspheric surfaces *R_5, *R_6, *R_{11}, and *R_{12} of the elements, using the convention that convex surfaces have positive radii and concave surfaces have negative radii, the third column lists the respective thicknesses of the elements, the fourth column lists the axial spacings between adjacent elements and the film plane, and the fifth and sixth columns list respectively the refractive and dispersive indices of the optical materials of the lens system.

4,060,313

ELECTROMAGNETICALLY DRIVEN OPTICAL BLADE

Toshihiro Kondo, Chofu, Japan, assignor to Toshihiro Kondo, Chofu and Fuji Photo Film Co., Ltd., Minami-ashigara, both of, Japan

Filed Mar. 9, 1976, Ser. No. 665,185
Claims priority, application Japan, Mar. 19, 1975, 50-33194
Int. Cl.[2] G05D *25/00*
U.S. Cl. 350—269 6 Claims



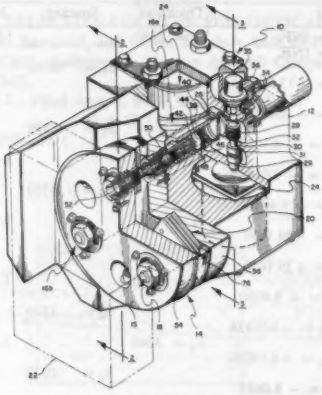
1. An optical blade which is electromagnetically driven comprising an opaque plastic sheet member and a permanent magnet sheet sealed therein, said permanent magnet sheet extending in parallel to the plastic sheet member at the middle of the thickness of said plastic sheet member, said permanent magnet sheet being provided with a number of perforations through which the plastic material on one side of the magnet sheet is bound with the plastic material on the other side thereof.

4,060,314

TWO AXES REMOTE MIRROR MOUNT

Theodore A. Heinz, Moorpark, Calif., assignor to Rockwell International Corporation, El Segundo, Calif.

Filed June 28, 1976, Ser. No. 700,430
Int. Cl.[2] G02B *5/08*
U.S. Cl. 350—285 8 Claims



1. In an apparatus to suspend and remotely position a device affixed to a backup plate and cantilevered from a fixed support by at least one V-shaped beam flexure suspension support, said device having at least one preloaded actuating means between said backup plate and said fixed support, the improvement which comprises:

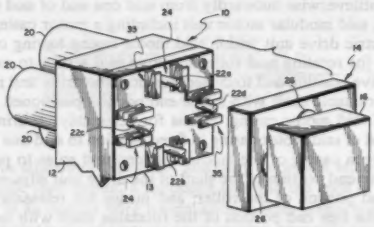
at least one preloaded differential ball-bearing screw actuating means affixed between said backup plate at a first end and said fixed support at a second end, said ball-bearing screw having a multiplicity of ball bearings encapsulated within an enclosed continuous helical race at both said first and second ends, said helical race at said first end having a different pitch angle than said helical race at said second end to provide differential movement between said first and second ends as said screw is rotated either clockwise or counter-clockwise, each of said multiplicity of ball bearings within said enclosed continuous race are in compressional contact with walls formed by said enclosed continuous race, the compressional force being supplied by said at least one V-shaped beam flexure between said backup plate and said fixed support, the combined deflection of both ball and contact surface of said walls averages out any error introduced into said apparatus between the multiplicity of balls which provides an adjustment precision of the backup plate with respect to said fixed support of about 0.5×10^{-6} in.

4,060,315

PRECISION MIRROR MOUNT

Theodore A. Heinz, Moorpark, Calif., assignor to Rockwell International Corporation, El Segundo, Calif.

Filed July 7, 1975, Ser. No. 593,357
Int. Cl.[2] G02B *5/08*
U.S. Cl. 350—289 4 Claims



1. An apparatus to suspend and remotely position, a device cantilevered from a fixed support means comprising:

a rigid base plate portion affixed to said fixed support,

a movable plate spaced from and positioned substantially parallel to said base plate portion,

at least three actuation means connected between said base plate portion and said movable plate to provide tip and tilt of said movable plate as well as a means to translate said movable plate away from or towards said rigid base plate portion,

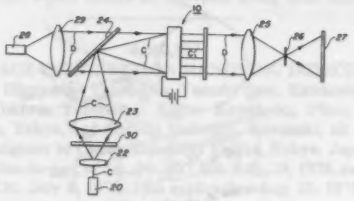
at least one flexure means connected in compression between said rigid base plate portion and said substantially parallel movable plate to preload said at least three actuation means in tension while resisting shear forces resultant from the weight of said device cantilevered from said fixed support, said at least one flexure means is a V-shaped beam flexure where one end of a first leg of the V is affixed to said rigid base plate and the end of the second leg of said V-shaped flexure is affixed to said movable plate, the opposite ends of said first and second legs are affixed to each other, the resultant joint is suspended between said rigid base plate and said movable plate, the elastic beams of said V-shaped flexure being under compressive loads to provide rigidity and resistance to shear forces as well as maintaining said actuation means in tension, and

means to lock said at least three actuation means thereby fixing said movable plate in a desired position.

4,060,316
IMAGING METHOD

Joel M. Pollack, Rochester, and John B. Flannery, Webster, both of N.Y., assignors to Xerox Corporation, Stamford, Conn.

Continuation of Ser. No. 552,897, Feb. 25, 1975, abandoned.
This application Mar. 22, 1976, Ser. No. 668,896
Int. Cl.[2] G11B 21/14; G02B 5/18; G02F 1/13
U.S. Cl. 353—20 15 Claims



1. A method of imaging, comprising:

a. providing an imaging member comprising, between two electrodes, a photoconductor in contact with a layer of homogeneously aligned nematic liquid crystalline material; said layer of nematic material having a thickness of from about 1 to about 6 microns and having negative dielectric anisotropy;

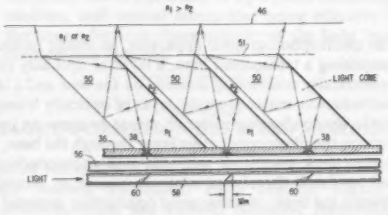
b. applying a D.C. voltage between said two electrodes above the parallel variable grating mode threshold voltage level for said nematic liquid crystalline material; and

c. during application of said D.C. voltage, imagewise exposing said photoconductor to actinic electromagnetic radiation from a first radiation source to form vortical domains of said liquid crystalline material in the parallel variable grating mode, wherein vortical domains of said liquid crystalline material are formed in a direction parallel to the direction of initial homogeneous alignment, and passing linearly polarized electromagnetic radiation from a second radiation source through regions of said nematic liquid crystalline material in the parallel variable grating mode, said linearly polarized electromagnetic radiation having a polarization direction substantially orthogonal to the major axes of said vortical domains.

4,060,317
COMPACT FOLDED MIRROR RECORDER AND VIEWER OF INFORMATION

George Johannus Yevick, Leonia, N.J., assignor to Personal Communications, Inc., Stamford, Conn.

Filed Sept. 12, 1975, Ser. No. 612,862
Int. Cl.[2] G03B 23/08, 21/28
U.S. Cl. 353—27 R 2 Claims



1. A compact optical device for both viewing and recording, including,

a. means for supporting and transporting a sheet carrying microimages, a sheet carrying microimages, the microimages corresponding to macro scenes recorded on the sheet, the microimages of and corresponding to any macro scene being dispersed over the area of the sheet,

b. means for illuminating dispersed portions of said sheet,

c. an aperture plate carrying lenses at fixed locations thereover, light cones passing through said lenses,

d. means for folding light from each light cone associated with each of said lenses to effectively shorten the length of each light cone,

e. means for limiting the solid angular extent of the light cones,

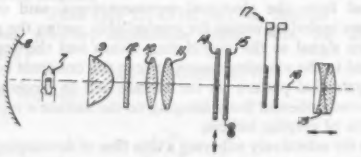
f. a rear projection viewing screen for receiving an image contained within each projected light cone,

g. said (b) means for illuminating being defined by a plurality of lighting sheets, each defined by a totally internally reflecting sheet having an array of reflectors between the two surfaces of the sheet, said reflectors being positioned and arranged so as to provide an array of sources of light emanating from one surface of said sheet, said (d) means for folding light cones including a plurality of parallel mirrors, a pair of said mirrors sandwiching the lighting sheets, the lighting sheets being parallel and making an angle of less than 90 degrees with the surface of the aperture plate, a reflecting surface on the side of said sheet which carries microimages opposite to the aperture plate, whereby light exiting from the reflectors in the lighting sheets passes through the lenses to the reflecting surface to illuminate microimages.

4,060,318
PROJECTION APPARATUS

Reginald Frederick Hansford, London, England, assignor to Decca Limited, London, England

Filed Mar. 22, 1976, Ser. No. 669,288
Int. Cl.[2] G03B 21/00, 21/26
U.S. Cl. 353—42 15 Claims



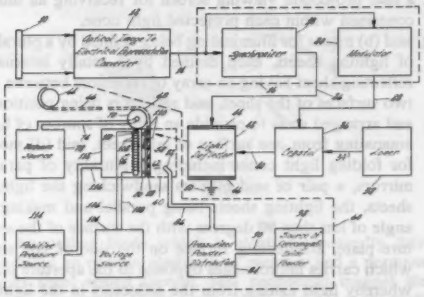
1. Navigational light simulating apparatus for use in a navigational training system comprising in combination a screen and a projection means for projecting a plurality of movable spots of light onto the screen to simulate a changeable pattern of navigational lights, said projection means comprising a plurality of light spot projectors displaced one from another laterally about a center line of the system extending between the screen and the projection means, wherein each projector comprises an optical system having an optical axis and including means defining an aperture which is controllably displaceable in a predetermined aperture plane, a light source for illuminating the aperture and means for focusing an image of the illuminated aperture onto the screen to form a respective spot of light thereon, said means defining the displaceable aperture comprising a pair of parallel plates mounted adjacent one another and normal to said optical axis, each being opaque to the light from said light source apart from a fine straight transparent line, said lines extending in orthogonal directions and crossing one another at a crossing point defining said aperture, mounting means by which each of said plates is mounted for linear movement in its own plane in a direction transverse the direction in which the respective transparent line extends, and means for independently moving said plates in said respective directions of linear movement, thereby to displace the aperture.

V 9 6 4 / 5 N 0 2 9 7 7 UMI

4,060,319
COHERENT BEAM IMAGING APPARATUS AND METHOD

Daniel J. Meaney, Jr., 574 Calle Anzuelo, Santa Barbara, Calif. 93111

Filed June 20, 1975, Ser. No. 588,668
Int. Cl.[2] G03G *15/24*
U.S. Cl. 355—3 DD 14 Claims



1. Apparatus for imaging graphic indicia comprising means for converting the graphic indicia into electrical representations thereof;

a source of a coherent beam of optical radiation having a wavelength within a particular wavelength range;

means disposed relative to the coherent beam and responsive to a modulating signal for modulating the propagation of the coherent beam at the particular wavelength within the wavelength range;

means responsive to a scanning signal for scanning said modulated coherent beam across a surface;

control means operatively coupled to said converting means for generating the modulation signal and the scanning signal from the electrical representations, said control means including means for controllably gating the modulation signal to the modulating means and the scanning signal to the scanning means to scan the coherent beam in a controlled pattern on the surface and to modulate the scanned coherent beam imaging on the surface a representation of graphic indicia;

means for selectively adhering a thin film of developing fluid on the imaged surface forming a developed image of said graphic indicia; and

means for establishing a gradient field which attracts and holds said thin film of developing fluid in communication with said surface as the modulated coherent beam is scanned thereacross.

4,060,320
TRANSFER MATERIAL SEPARATING DEVICE

Yasuhiko Doi, Toyokawa; Yukio Tokura, Toyohashi, and Koji Imaizumi, Aichi, all of Japan, assignors to Minolta Camera Kabushiki Kaisha, Osaka, Japan

Filed Dec. 29, 1975, Ser. No. 645,293
Claims priority, application Japan, Jan. 8, 1975, 50-5708[U]; Jan. 14, 1975, 50-7222[U]
Int. Cl.[2] G03G *15/00*
U.S. Cl. 355—3 R 12 Claims

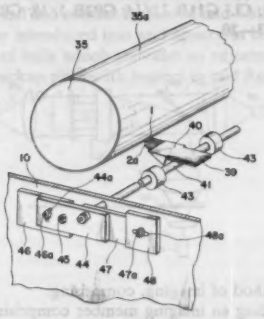
1. A transfer material separating device for use in an electrophotographic copying apparatus having:

a platform for supporting thereon an original object to be copied;

an optical system beneath said platform for optically transferring the image of said object on said platform; and

a rotatable photoreceptor having a photoconductive surface for receiving the image from said optical system and for contacting and transferring said image to said transfer material, said separating device comprising:

separating claw member means adjacent and at least intermittently contacting said photoreceptor for separating said transfer material from said photoconductive surface after said image is transferred to said transfer material, said claw member means having a semi-circular shaped front portion contacting said photoconductive surface, said front portion having short fibers of flexible material thereon; and

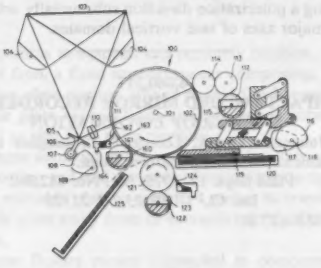


contacting means operatively connected to said claw member means for causing said claw member means to contact said photoconductive surface.

4,060,321
ELECTRO-PHOTOGRAPHIC ELEMENT

William Alan Stewart Butement, 5A Barry Street, Kew, Victoria, Australia

Division of Ser. No. 308,700, Nov. 22, 1972, Pat. No. 3,941,593.
This application Jan. 14, 1976, Ser. No. 648,955
Claims priority, application Australia, Dec. 9, 1971, 7367/71; Aug. 18, 1972, 0142/72
Int. Cl.[2] G03G *15/28*
U.S. Cl. 355—8 16 Claims



1. In an electrophotographic apparatus, an image receiving plate comprising a transparent base, a layer of optically transparent, electrically conducting material on the base and a layer of photoconductive material on the layer of optically transparent, electrically conducting material, means to cause an image to impinge on the photoconductive layer through the base, and a developing tank associated with the said photoconductive layer and insulated therefrom, a power source to provide a field between the layer of transparent conducting material and a plate associated therewith, the plate being formed on part of the surface of a cylindrical drum mounted for rotation about its axis, means to project an image through the part of the drum which is not the plate onto the plate, means to apply pigment to the drum to form an image thereon, means whereby paper or the like can be brought into contact with the drum and the image transferred from the drum to the paper comprising a second drum having paper receiving means thereon the drums

rotating at the same speed and being relatively movable from a position at which an image can be received and pigment applied to the first drum to a position at which the image can be transferred to paper on the second drum, said means to apply pigment to the drum including a plurality of sources of pigment which can selectively be applied to the first drum when it is in its image receiving condition, filters locatable in the path of the image whereof the apparatus can form images of different colors on paper on the second drum, and the sources of pigment including rollers having a length at least equal to that of the drum, which rollers are movable along their axis.

4,060,322
IMAGE INFORMATION HANDLING DEVICE

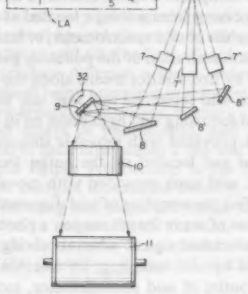
Kazuhiro Hirayama, Yokohama; Yasushi Sato, Kawasaki; Taisuke Tokiwa, Yokohama; Kazuo Kawakubo, Hino; Fujio Iwatate, Tokyo, and Hisashi Nakatsui, Kawasaki, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation-in-part of Ser. No. 607,504, Aug. 25, 1975, and Ser. No. 594,126, July 8, 1975. This application Aug. 25, 1975, Ser. No. 607,503

Claims priority, application Japan, Sept. 9, 1974, 49-103642; Sept. 12, 1974, 49-105257; July 10, 1974, 49-79475; Oct. 14, 1974, 49-117892; Aug. 22, 1974, 49-96500; Sept. 14, 1974, 49-106342; Dec. 17, 1974, 49-144727; Sept. 11, 1974, 49-104737; Sept. 12, 1974, 49-105257

Int. Cl.² G03B *23/00, 27/70*

U.S. Cl. 355—60 **10 Claims**



6. An image information handling device comprising:

means for modulating a light beam by an image information signal;

a medium for receiving the modulated light beam;

scanning means for causing the modulated beam to scan said medium; and

optical means between said modulating means and said scanning means for selectively directing the modulated beam along any one of a plurality of light paths extending to said medium, said optical means also being effective to vary the image forming characteristic of the light beam incident on said medium.

4,060,323
IMAGE INFORMATION HANDLING METHOD AND DEVICE

Kazuhiro Hirayama, Yokohama; Yasushi Sato, Kawasaki; Taisuke Tokiwa, Yokohama; Fujio Iwatate, Tokyo; Kazuo Kawakubo, Hino, and Hisashi Nakatsui, Kawasaki, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation-in-part of Ser. No. 594,126, July 8, 1975. This application Aug. 25, 1975, Ser. No. 607,504

Claims priority, application Japan, Sept. 9, 1974, 49-103642

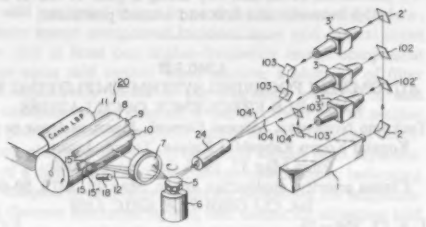
Int. Cl.² G01D *15/10*; G03B *23/00, 27/32, 27/70*

U.S. Cl. 355—60 **24 Claims**

1. A method of imaging light on a medium to form a plurality of information elements, said method comprising the steps of:

forming a plurality of light beams;

modulating said plurality of light beams by image information signals in such a manner that the same modulation is applied to each of a predetermined number of said plurality of light beams, said number being selected in accordance with a desired size of the information elements formed on said medium: and



deflecting each of said modulated light beams toward said medium to scan said medium and form thereon the predetermined number of rows of light spots having the same modulation;

wherein the size of the information elements, defined by adjacent rows of identical light spots, is changed by varying the number of light beams receiving the same modulation.

4,060,324
LENS SWITCHING MECHANISM FOR USE IN COPYING MACHINE

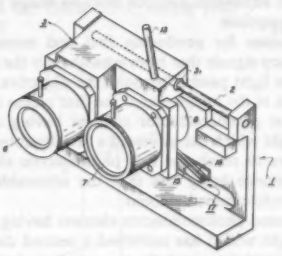
Susumu Wakatsuki, Ebina, Japan, assignor to Rank Xerox Ltd., London, England

Filed July 27, 1976, Ser. No. 709,033

Claims priority, application Japan, Nov. 21, 1975, 50-157371[U]

Int. Cl.² G03B *27/70*

U.S. Cl. 355—60 **3 Claims**



1. In a copying apparatus including means for projecting an image of an original onto a photosensitive member selectively at one of a plurality of magnifications, said projecting means including:

two lenses;

a movable carriage for supporting said lenses;

means for supporting said carriage for movement between a first position wherein one of said lenses is operative and a second position wherein the other of said lenses is operative;

the improvement wherein, said apparatus further includes:

adjustable means for stopping said carriage at said first or second positions; and over center means responsive to the movement of said carriage more than half its distance of travel between said first and second positions for moving

and biasing said carriage against said stop means, said over center means comprising:

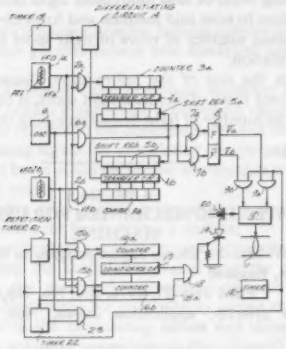
a guide member having inclined surfaces meeting at an apex, said guide member being supported by said carriage support means; an arm pivotably supported by said carriage; a roller supported at one end of said arm; and a spring biasing said arm about said pivot, said spring being connected to the other end of said arm, said arm and roller being arranged so that said roller is biased against said inclined surfaces, said apex of said inclined surfaces being positioned about halfway along a path of travel of said roller between said first and second positions.

4,060,325

AUTOMATIC FOCUSING SYSTEM EMPLOYING TWO VARIABLE FREQUENCY OSCILLATORS

Tsukumo Nobusawa, Minami Oizumi, Japan, assignor to Asahi Kogaku Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed May 17, 1976, Ser. No. 687,040
Claims priority, application Japan, May 20, 1975, 50-60006
Int. Cl.² G03B *7/08*; G01C *3/08*
U.S. Cl. 354—25 **5 Claims**



1. In an automatic focusing system having an objective spaced an adjustable distance from an image plane, apparatus which comprises:

first means for producing first and second variable-frequency signals that have substantially the same frequency when light passing through the objective is brought into focus at the image plane, the first means including

a first photoconductor element having impinging on it light which has traversed a first distance from the objective to reach the first photoelectric element, the first distance being less than the adjustable distance by a predetermined amount

a second photoconductor element having impinging on it light which has traversed a second distance from the objective to reach the second photoelectric element, the second distance being greater than the adjustable distance by a predetermined amount

each of the photoelectric elements serving as a variable resistor having a peak resistance value when the light impinging on it is in focus;

a first variable frequency oscillator controlled by the resistance value of the first photoelectric element for producing the first variable frequency signal, and

a second variable frequency oscillator controlled by the resistance value of the second photoelectric element for producing the second variable frequency signal; and

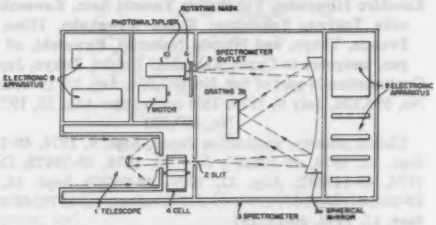
second means responsive to a difference in frequency between the first and second variable-frequency signals for adjusting the spacing between the objective and the image plane to a relative position at which the frequencies thereof are substantially the same.

4,060,326

OPTICAL INSTRUMENT FOR MEASURING CONCENTRATIONS OF POLLUTING GASES ON LONG AND SHORT GEOMETRICAL PATHS

Tiziano Tirabassi, Carpi; Giorgio Giovanelli, Bologna; Giulio Cesari, Bologna; Ubaldo Bonafe, Bologna, and Ottavio Vittori Antisari, Bologna, all of Italy, assignors to Tecneco S.p.A., Fano (Pesaro), Italy

Filed July 3, 1975, Ser. No. 592,727
Claims priority, application Italy, July 4, 1974, 3431/74
Int. Cl.² G01J *3/42*
U.S. Cl. 356—96 **9 Claims**

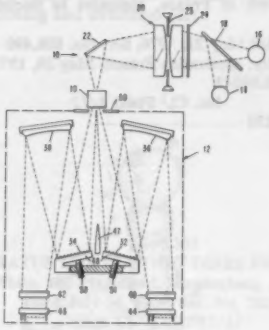


1. An optical instrument for measuring concentrations of polluting gases on long and short geometrical paths, characterized in that it comprises a spectrometer; a telescope focussing a light beam coming from a source located at a predetermined distance, into a slit of said spectrometer; at least a cell, containing a known concentration of the polluting gas under examination, brought by first control means along the path of the light beam between said telescope and said slit; said spectrometer dispersing and focussing said light beam on its own outlet focal plane; a mask provided with movable slits, moved by second control means and located on the outlet focal plane of said spectrometer, said mask provided with movable slits that are adapted to effect the sampling of said dispersed light beam in at least four series of wave length ranges; a photodetector giving at the outlet electrical signals when receiving at the inlet light signals caused by said sampling; an electronic apparatus, located at the outlet of said photodetector, including means to elaborate at least four numerical values, of which: a first numerical value relating to the ratio between two electrical signals referring respectively to the sampling of a first and second of said series of wave length ranges of the dispersed light beam, a second numerical value referring to the ratio between two electrical signals referring respectively to the sampling of a third and fourth of said series of wave length ranges of the dispersed light beam, a third numerical value referring to the ratio between two electrical signals referring respectively to the sampling of said first and second series of wave length ranges of the dispersed light beam when said cell is interlocated along the light beam, and a fourth numerical value relating to the ratio between two electrical signals referring respectively to the sampling of said third and fourth series of wave length ranges of the dispersed light beam when said cell is interlocated along the path of the light beam; said elaboration of the numerical data being such to give at the outlet a numerical value given by the value of the known concentration of the polluting gas contained in said cell multiplied by the length of the cell and by a ratio having as numerator the difference between said first and second numerical value and as denominator the product of the distance between said source and the measuring device by the value obtained substracting from the difference between said third and fourth numerical value the said difference between the first and second numerical value.

4,060,327
WIDE BAND GRATING SPECTROMETER

Lawrence Jacobowitz; Einar S. Mathisen, both of Poughkeepsie, and Lawrence D. Thorp, Yorktown, all of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Sept. 13, 1976, Ser. No. 722,944
Int. Cl.[2] G01J 3/42, 3/12
U.S. Cl. 356—96 7 Claims



1. In a spectrometer for measuring the intensities of radiant energies within a beam of light across different wavelengths thereof, said spectrometer including an elongated rectangular entrance slit for admitting said beam, the combination comprising:

first and second stationary gratings disposed in the path of said beam admitted by said slit, each of said gratings having lines parallel to said slit, the lines of each grating being different to produce different primary orders of dispersion, said gratings being operative to dispense light in said beam into two separated dispersed beams;

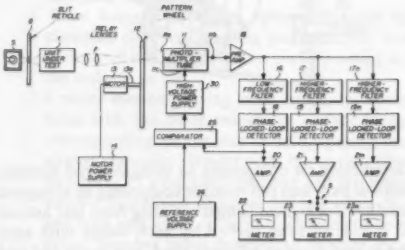
first and second arrays of photodiodes, said photodiodes being arranged in each array along a line and operative to produce output signals proportional to the intensities of rays of radiant energies illuminated thereby;

and means for focusing said dispersed beams separately on said arrays so as to image said slit thereon, whereby successive photodiodes in each array produce outputs proportional to the intensities in rays of successive wavelengths.

4,060,328
SYSTEM FOR MEASURING THE MODULATION TRANSFER FUNCTION OF AN OPTICAL DEVICE

William E. Flynt, Garland, Tex., assignor to Varo, Inc., Garland, Tex.

Filed Feb. 6, 1976, Ser. No. 655,905
Int. Cl.[2] G01B 9/00
U.S. Cl. 356—124 23 Claims

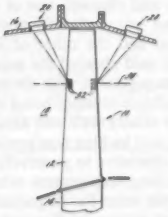


1. A system for determining the image-forming quality of an optical device by projecting an image through said device and measuring the relative amount of light transmitted therethrough at a plurality of spatial frequencies, with said system determinations being normalized automatically and continuously throughout the duration of the evaluation of the optical devices under test, said system comprising: photoelectric transducer means, including an optical input section and an electrical output section, for converting a light signal incident upon said input section into a corresponding electrical signal at said output section; means for projecting said image along a projection path through said optical device and onto said optical input section; means disposed in said projection path for modulating said projected image to produce simultaneously a low-frequency image component incident upon said optical input section and at least one higher-frequency image component incident upon said optical input section; a plurality of filter means respectively tuned to the frequency of each of said image component and coupled to the electrical output section of said photoelectric transducer means for developing a corresponding plurality of discrete electrical signals each representative of a different one of said image components; indicating means coupled to said filter means for indicating the amplitude of said discrete electrical signals; and means for adjusting said system to cause said indicating means to indicate a predetermined amplitude for said low-frequency image component, said adjusting means comprising means for comparing the amplitude of said discrete low-frequency signal with the amplitude of a preselected reference signal and generating an error signal which automatically adjusts said system to substantially equalize the amplitude of said reference signal and said low-frequency signal, whereby the system is automatically and continuously set to a normalized level for the optical device being measured during the evaluation of the optical device under test and with the higher-frequency image components then capable of being measured under a standardized system for determining the image-forming quality of a series of optical devices at one or more higher spatial frequencies.

4,060,329
METHOD AND APPARATUS FOR MEASURING DEFLECTION OF ROTATING AIRFOILS

Delmar H. Ellis, Cincinnati, Ohio, assignor to General Electric Company, Cincinnati, Ohio

Filed Oct. 23, 1975, Ser. No. 625,053
Int. Cl.[2] G01B 11/00; G01M 9/00
U.S. Cl. 356—167 14 Claims



1. A method of measuring deflection of a rotating member of finite radial length comprising the steps of:

illuminating a portion of the radial length of the rotating member spaced from the tip thereof with a first high intensity light beam projected from a location axially disposed from said member, the illuminated portion being that at which deflection is to be determined;

illuminating a rotating reference location with a second high intensity light beam;

reflecting and dispersing the first and second high intensity light beams from their respective locations as light impulses;

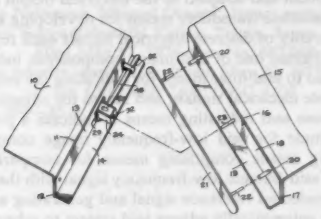
sensing at least a portion of the reflected light impulses with light sensitive means;

converting the light beam impulses to electrical impulses;
measuring the time increment between the electrical impulse related to the deflection measurement location and the electrical impulse related to the rotating reference location; and
converting the time increment to a length dimension.

4,060,330
LOOSE LEAF BINDER LOCKING DEVICE

Anthony Baccile, Lansdowne, Pa., assignor to Buchan Industries, Inc., Clifton Heights, Pa.

Filed Aug. 11, 1976, Ser. No. 713,380
Int. Cl.² B42F 5/02, 13/30
U.S. Cl. 402—47 7 Claims

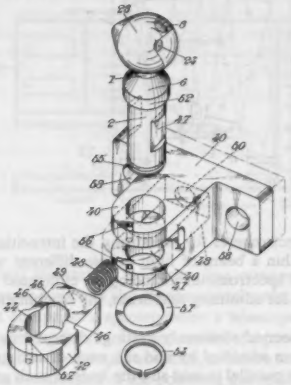


1. In a loose leaf binder of the type having separable front and back cover members having coacting telescopically extensible posts which project through perforations in the loose leaf sheets for holding the same positioned between said cover members, a locking mechanism for releasably securing said cover members together comprising in combination a locking post on a first one of said cover members and a lock device on the other one of said cover members adapted to telescopically receive said locking post, said lock device including an elongated main body part having an elongated guide channel conforming to the shape of said locking post and extending substantially the entire length of said main body part into which said locking post is rectilinearly insertable, a pair of post-clutching roller elements respectively disposed at opposte sides of said channel adjacent the entrance thereto and adapted to frictionally engage diametrically opposite sides of said locking post at any point along the length of the portion of the post which is received in said channel, one of said elements being held in a fixed position for constant frictional engagement with one side of said post and the other of said elements being shiftable relatively to said channel for movement thereof into and out of locking engagement with the opposite side of said locking post, said shiftable element being normally biased into a position wherein it coacts with said axially fixed element to automatically clutch said locking post against withdrawal from said channel, means operative to positively draw said shiftable element out of clutching engagement with said locking post whereby to release the same for its partial or complete withdrawal from said lock device, said means including a rectilinearly shiftable elongated draw bar which is disposed in closely spaced parallel relation to only one side of said locking post guide channel and is operatively connected at its outer end to said shiftable roller element for moving the latter into and out of said locking engagement with said locking post, spring means acting on the inner end of said bar to normally bias the same outwardly whereby the automatically effect clutching engagement of said shiftable roller element with said locking post, and an operating lever wholly confined between the covers of said binder, said lever being pivoted within said locking device and connected to said bar cross-wise thereof for limited swinging movement through an arc of very small degree in a plane extending parallel to the path of movement of said bar and the expansible back of the binder, said operating lever being manually actuatable against the bias of said spring means to draw said bar into its post unlocking position and automatically shiftable into inactive position solely under the biasing effort of said spring means.

4,060,331
SPHERICAL COUPLINGS FOR VEHICLE TOWING OR KINDRED PURPOSES

Michel Domer, Montigny-les-Cormeilles, and Jean-Yves Haÿ, Colombes, both of France, assignors to Societe Paulstra, France

Filed May 21, 1976, Ser. No. 688,490
Claims priority, application France, May 28, 1975, 75.16664; Jan. 7, 1976, 76.00243
Int. Cl.² F16D 1/12
U.S. Cl. 403—130 12 Claims

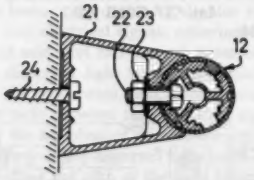


1. A ball-joint coupling comprising: a male coupling member provided with a ball; a layer of elastomeric material bonded on said ball; a part-spherical cap received on said ball over said elastomeric layer and bonded to said layer; a female coupling member having a part-spherical socket for releasably receiving said cap; and retaining means, acting between said cap and said female coupling member, for preventing relative rotation of said cap in said socket at least in the horizontal plane.

4,060,332
SPLINE AND GROOVE CONNECTION

Kim Jacobsen, 4 Spurvevaenget, Odense, Denmark (5000)

Filed Nov. 6, 1975, Ser. No. 629,214
Claims priority, application Denmark, Nov. 14, 1974, 5926/74
Int. Cl.² F16B 7/00
U.S. Cl. 403—359 6 Claims



1. An assembling set comprising an elongated rod member and a structural part, said rod member comprising an elongated hub, a plurality of elongated flanges radiating from said hub, an elongated individual head carried by each flange with each head being spaced from an adjacent head, said heads and said flanges defining a longitudinal groove between each adjacent pair of heads and a longitudinal cavity between each pair of flanges, each groove opening into a respective one of said cavities, said heads having arcuate outer surfaces in transverse

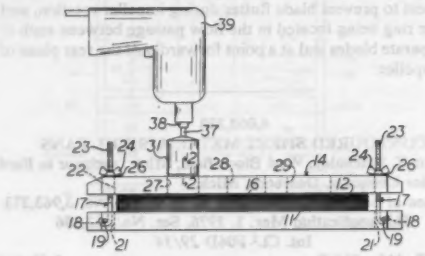
section wherein said rod member is generally circular in cross-section, said structural part including a tubular portion telescoped over said rod member, and said structural part having a radially inwardly extending projection seated in one of said grooves and anchoring said structural part against rotation around said rod member, said tubular part being of limited axial extent as compared to said rod member and there being at least one tubular spacer telescoped over said rod member and axially positioning said structural part.

4,060,333

APPARATUS FOR CUTTING DISKS FROM SHEETS

John T. White, 100 Pike Road, Birmingham, Ala. 35218

Filed July 14, 1976, Ser. No. 705,093
Int. Cl.² B23D *45/14*
U.S. Cl. 408—103 **4 Claims**



1. Apparatus for cutting disks from sheets of material comprising:

a. a first clamping element having a flat surface disposed to engage one side of and support a stack of sheets of material from which said disks are to be cut,

b. a second clamping element having a flat surface disposed to engage the other side of said stack of sheets,

c. an elongated connector member having a hook-shaped end pivotally connected to a transverse pin carried by each end of said first clamping element with the other end of each said connector member being adapted to extend toward said second clamping element,

d. releasable means connecting said other end of each said connector member to one adjacent end of said second clamping element,

e. there being at least one opening through said second clamping element extending perpendicular to said sheets of material and being of a size corresponding to the size of the disks to be cut,

f. a cutter member having inner and outer cylindrical surfaces with the outer cylindrical surface being of a size corresponding to the size of said opening through said second clamping element with the inner cylindrical surface being of a constant diameter and providing an unrestricted cylindrical chamber for receiving the cut disks and with said inner cylindrical surface at one end of said cutter member being beveled to provide an outwardly flaring annular surface which terminates in an annular cutting edge, and

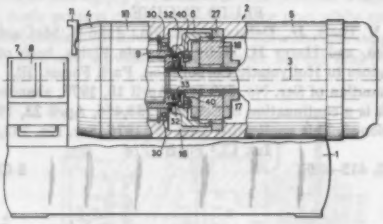
g. means operatively connecting the other end of said cutter member to rotary power means.

4,060,334

MACHINE FOR MACHINING BARS AND TUBES

Rudolf Wagner, Stuttgart, Germany, assignor to Remswerk Christian Foll und Sohne, Waiblingen, Germany

Filed Jan. 19, 1976, Ser. No. 650,157
Claims priority, application Germany, Jan. 18, 1975, 7501376[U]
Int. Cl.² B23B *39/10*
U.S. Cl. 408—126 **16 Claims**



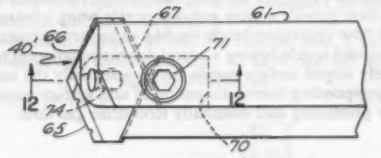
1. A thread cutting machine, which includes in combination: housing means, a cutting head with an axis and spindle means therewith journalled in said housing means, motor means having an axis arranged in axial alignment with said cutting head, and a planetary gear transmission with a main axis and having an input gear drivingly connected to said motor means and also having an output gear drivingly connected to said cutting head, said planetary gear transmission being arranged between said motor means and said cutting head, the main axis of said planetary gear transmission being in alignment with the axis of said motor means and with the axis of said cutting head.

4,060,335

SPADE DRILL

William Stuart Holloway, St. Charles, Ill., and Manfred Grunsky, Dreieichenhain, Germany, assignors to Amtel, Inc., Providence, R.I.

Continuation-in-part of Ser. No. 595,607, July 14, 1975, abandoned. This application Oct. 26, 1976, Ser. No. 735,143
Claims priority, application Germany, Mar. 4, 1976, 2608809
Int. Cl.² B23B *27/16*
U.S. Cl. 408—233 **5 Claims**



1. Spade drill having a holder and a spade cutting blade said holder having a clamp slot and a clamp screw which passes through the clamp slot perpendicularly to its clamp surfaces, said holder clamping slot having a narrow extension into the bottom thereof and diametrically across the holder on an axial plane thereto, said blade being received in said slot in such a way that the drill bit of the spade cutting blade sticks out of the clamp slot in feed direction, and the spade cutting blade rests against an abutment surface in said slot to seat it and avoid a sideways movement of the spade cutting blade, said abutment surface being V-shaped with respect to an axial plane of said holder, the included angle of the abutment surface being smaller than the included angle between the cutting surfaces of the cutter blade, the side of the spade cutting blade located across from the exposed drill bit surface having a second drill bit surface whose shape corresponds to the one of the first drill bit surface, said spade drill blade being provided with a central

aperture and being urged against the abutment surfaces by means of a holding piece which passes through the one clamp slot arm and engages said central aperture of the spade cutting blade substantially on the central rotational axis of the holder.

2. A spade drill as in claim 1 wherein the holding piece is a screw that passes through the holder in the region of the extension slit transversely to the plane of the blade.

4,060,336

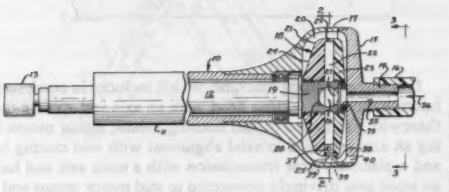
FLUID ENGINE

James V. Theis, Jr., Delray Beach, Fla.; John B. McCord, Evanston, and Harry H. Holly, Olympia Fields, both of Ill., assignors to Hollymatic Corporation, Park Forest, Ill.

Continuation of Ser. No. 569,544, April 18, 1975, abandoned, which is a continuation of Ser. No. 353,456, April 23, 1973, abandoned. This application Oct. 15, 1976, Ser. No. 732,905

Int. Cl.² F01B *1/18*

U.S. Cl. 415—80 **6 Claims**



1. A pressure gas turbine, comprising: a casing having a pressure gas entrance and a gas exit defining a gas fow path; a circular rotor in said casing rotatable about an axis of rotation and having a hollow interior section forming a part of said flow path and being substantially free of impediments tending to interfere with gas flow and to impart added rotational force to said gas during its flow through said rotor, said rotor having an arcuate surface means as a part of said hollow interior section defining a part of said gas flow path, said surface means being outwardly arcuately sloped relative to said axis and to said flow path; and a converging-diverging nozzle means for said gas aligned in series gas flow relationship with said arcuately sloped surface for converting gas pressure energy of said gas flowing into the turbine nozzle to gas velocity energy of said gas flowing from the nozzle, said nozzle having an internal passage with a converging entrance, a throat and a diverging exit, said gas flow path between said arcuate surface means of said hollow interior section and said nozzle being substantially free of flow restricting bends tending to impart turbulence to said gas, said nozzle having a lateral dimension adjacent to said arcuately sloped surface means that is essentially the same as the corresponding lateral dimension of said surface means for further promoting said essentially streamline gas flow.

4,060,337

CENTRIFUGAL COMPRESSOR WITH A SPLITTER SHROUD IN FLOW PATH

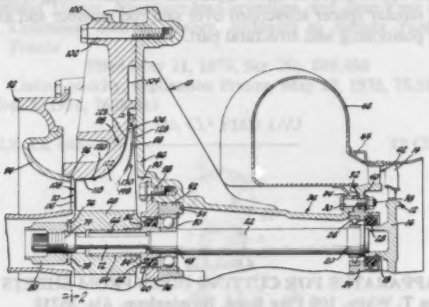
Albert H. Bell, III, Birmingham, Mich., assignor to General Motors Corporation, Detroit, Mich.

Filed Oct. 1, 1976, Ser. No. 728,721

Int. Cl.² F01D *5/22*

U.S. Cl. 416—186 R **3 Claims**

1. A low inertia centrifugal rotary compressor impeller of unitary construction for association with a gasifier turbine and wherein the gasifier turbine is driven by motive fluid to accelerate the impeller comprising: an impeller hub having means for connection to a gasifier turbine shaft, a plurality of blades on said hub each having a root portion integrally connected to the outer periphery of the hub and defining a flow passage with an adjacent blade, each of said blades including a free rear edge portion directed essentially radially outwardly of the hub and being circumferentially spaced with respect to an adjacent blade free rear edge portion to define a rear opening through the impeller at the hub from each of the flow passages to reduce windage losses during impeller operation, a flow splitter ring formed continuously circumferentially around the impeller and being integrally formed with each of the separate blades, said flow splitter ring having an inlet edge located at the transition of axial to radial flow through the impeller and



including an outlet edge located adjacent the outer periphery of the circumferentially spaced blades of the impeller, said flow splitter ring interconnecting each of the separate blade members to prevent blade flutter during impeller rotation, said splitter ring being located in the flow passage between each of the separate blades and at a point forwardly of the rear plane of the impeller.

4,060,338

CONTOURED SHEET METAL AIRFOIL FANS

William T. Macauley, West Bloomfield, Mich., assignor to Ford Motor Company, Dearborn, Mich.

Division of Ser. No. 485,645, July 3, 1974, Pat. No. 3,963,373. This application Mar. 1, 1976, Ser. No. 662,386

Int. Cl.² F04D *29/34*

U.S. Cl. 416—214 R **3 Claims**

1. A fan assembly, comprising:

a. a multiple number of sheet metal blades useful for impelling air and having a predetermined curvilinear air foil contour,

b. a multiple number of blade roots each integral with one each of said blades, and having substantially all portions thereof constructed of a single ply sheet metal, said root having a curvilinear web extending from said blade along an axis of said blade disposed between the leading and trailing edges of said blade, said root having symmetrically arranged wing portions extending from leading and trailing edges of said web, said wings for each of said blade roots comprising a tab extending substantially along the entire leading or trailing edge of said web,

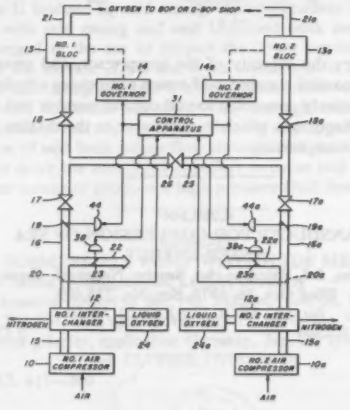
c. a hub formed of at least one pair of single ply discs each joined at a central zone and separated to form a hollow ring at a radially outer zone, said hollow ring having circumferentially spaced receptacles for receiving each of said blade root assemblies and to enclose at least part of said tabs, said hub receptacles having flanges which ex-

tend toward the root assembly with the edges of said flanges terminating to form a mating relationship with the contour of said web, said hub further having means for securing said root assemblies within said receptacles against relative rotary movement therein, said hub means comprising slots complimentary in shape of said tabs and receiving said tabs for extension therethrough.

4,060,339
METHOD AND APPARATUS FOR CONTROLLING A GAS-PRODUCING FACILITY

Frederick L. Raff, Worth, and Edward Szymanski, Bloom, both of Ill., assignors to United States Steel Corporation, Pittsburgh, Pa.

Filed Sept. 23, 1976, Ser. No. 725,802
Int. Cl.² F04B *41/06*
U.S. Cl. 417—2 **10 Claims**



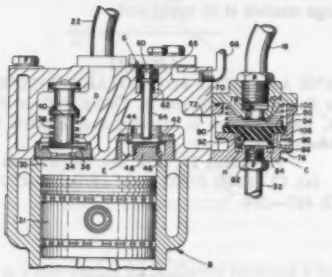
1. In the operation of a gas-producing facility which includes at least two independently operable plants, each of said plants having a respective interchanger and a respective compressor for receiving gas from its interchanger during normal operation, an improved method of operating and controlling said plants during periods of reduced operation when less then all of said compressors are running, said method comprising operating said interchangers at reduced rates, directing the gas output from said interchangers to a compressor which is running, developing a control signal representative of the combined gas outputs of the interchangers, and utilizing said signal to control the speed of the compressor which is running.

4,060,340
AIR COMPRESSOR WITH INLET DIVERSION VALVE

LeRoy Yanik, and Dario R. Gross, both of Owosso, Mich., assignors to Midland-Ross Corporation, Cleveland, Ohio

Filed Dec. 24, 1975, Ser. No. 644,116
Int. Cl.² F04B *49/00*; F16B *15/18*
U.S. Cl. 417—28 **5 Claims**

1. A compressor having an inlet port communicating with a pressurized gas source, a compressor inlet valve communicating with said inlet port, a governor and unloader for unloading said compressor by maintaining said inlet valve open, diversion valve means between said inlet port and the pressurized gas source for blocking communication of the pressurized gas source with said inlet valve through said inlet port when said governor and unloader operate to maintain said inlet valve open, said diversion valve means including a valve body having generally oppositely located gas source and governor ports respectively communicating with said pressurized gas source and with said governor, said valve body having supply and vent ports located intermediate said gas source and governor ports and respectively communicating with said inlet port and with atmosphere, said diversion valve means including mounting means for mounting same directly to said compressor with said supply port in direct communication with said inlet port, a movable valve member in said valve body and including an enlarged main body portion and a smaller extension portion, said valve member being movable between a first position wherein said main body portion closes said vent port while establishing communication directly therepast between said gas source and supply ports and a second position wherein said main body portion closes said gas source port while establishing communication directly therepast between said supply and vent ports, said movable valve member in both said positions

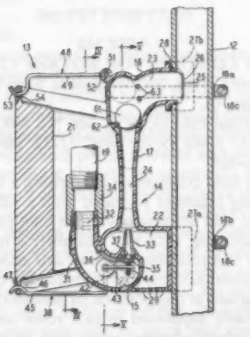


thereof maintaining said governor port isolated against communication with the other of said ports, yieldable biasing means acting directly on said main body portion of said valve member for normally biasing said valve member to said first position, said valve body having a cylindrical bore defining a variable volume chamber communicating with said governor port and including a variable volume chamber wall, said extension portion of said valve member being positioned in said chamber in sliding sealing engagement with said wall for movement of said valve member to said second position by fluid pressure supplied to said variable volume chamber through said governor port.

4,060,341
AUTOMATIC AUXILIARY JET SUMP PUMP

David L. Tremain, Sterling; Burt L. Beach, and James C. Hadley, both of Prophetstown, all of Ill., assignors to Houdaille Industries, Inc., Buffalo, N.Y.

Continuation-in-part of Ser. No. 529,804, Dec. 5, 1974, abandoned. This application Sept. 19, 1975, Ser. No. 614,795
Int. Cl.² F04F *5/48*
U.S. Cl. 417—182.5 **14 Claims**



1. An auxiliary water jet sump pump to supplement an electrical sump pump connected to a vertically extending discharge conduit, said water jet sump pump comprising a hollow

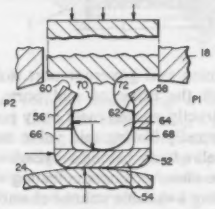
body section having a connection to said discharge conduit, a vertically extending venturi passageway located within said body section, means for positioning said venturi passageway parallel to said discharge conduit and transversely spaced therefrom, the lower end of said venturi passageway being in fluid communication with a nozzle disposed in axial alignment with said venturi passageway, a valve for admitting water to said nozzle in response to a preselected fluid level in the sump, and a check valve in the upper part of said body section, the upper end of said venturi passageway being in fluid communication with said check valve and being in fluid communication with the conduit through said check valve, and said body section being in fluid communication with said electrical sump pump at its lower end and in fluid communication with said discharge conduit at its upper end.

4,060,342

VANE ASSEMBLY FOR ROTARY COMPRESSOR

Delmar R. Riffe, and Robert R. Young, both of Franklin Borough, Pa., assignors to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed June 17, 1976, Ser. No. 697,164
Int. Cl.[2] F04B *49/00*; F01C *19/04*; F04C *27/00*
U.S. Cl. 417—284 **3 Claims**



1. In a blade and shoe vane assembly for a rotary device in which the shoe socket encompasses the blade edge in a cylindrical pivot type joint, the improvement comprising means for venting from the space on one side of said shoe to the space on the other side under conditions of the pressure differential between the two sides exceeding a predetermined value, comprising relief openings in both sides of said shoe, and said blade edge is smaller than said shoe socket to permit movement of said edge within the socket to a position in which said relief openings are in communication with each other, said blade edge bearing against the base of said shoe socket under normal operating conditions in which the pressure differential is less than said predetermined value so that under the normal operating conditions communication between said relief openings is blocked.

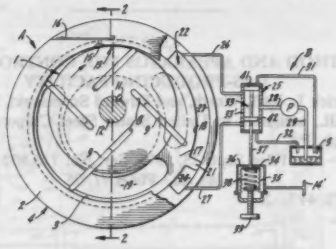
4,060,343

CAPACITY CONTROL FOR ROTARY COMPRESSOR

Alwin B. Newton, York, Pa., assignor to Borg-Warner Corporation, Chicago, Ill.

Filed Feb. 19, 1976, Ser. No. 659,188
Int. Cl.[2] F04B *49/02*; F01C *21/12*; F04C *29/08*
U.S. Cl. 417—309 **2 Claims**

1. A rotary fluid compressor comprising a housing having a closed working chamber provided with a substantially cylindrical surface, said housing having an inlet port and an outlet port communicating with said chamber; a rotor mounted in said chamber and rotatable about an axis eccentric to the axis of said cylindrical surface, said rotor having contact with said cylindrical surface at one point on its periphery, and a plurality of vanes slidably supported in said rotor and engaging said cylindrical surface whereby when said rotor is rotated said vanes compress fluid from said inlet port to said outlet port providing a compression area within said chamber; and a control member rotatably mounted in said housing and provided with an elongated arcuate aperture in fluid contact with said working chamber and spanning at least one of said vanes to permit fluid to bypass the vanes and thereby change the compression area in said chamber, said control member being operative upon rotation thereof to vary the location of the aperture to vary the compression volume of said chamber to



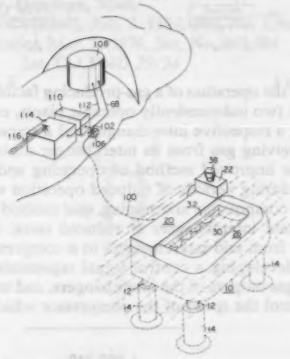
thereby vary the capacity of the compressor, and means to rotate said control member, said means comprising a hydraulic valve operatively connected to said control member and actuated by a diaphragm which is responsive to the suction pressure of the compressor.

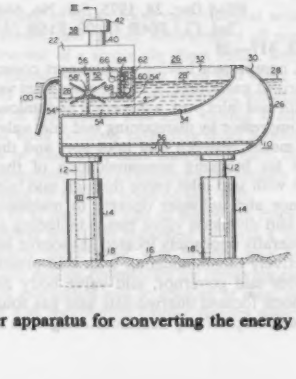
4,060,344

TRANSDUCER FOR CONVERSION OF SEA WATER-ENERGY

Fumio Ootsu, 6-4, Shirahae-cho, Saseho, Nagasaki, Japan

Filed Oct. 26, 1976, Ser. No. 735,409
Int. Cl.[2] F04B *17/02*; F03B *13/10*
U.S. Cl. 417—330 **3 Claims**





1. A transducer apparatus for converting the energy of sea

waves to an energy of a high pressure fluid, comprising,in combination, a rectangular casing having an interior communicating with the air, a plurality of impeller chambers disposed in spaced relationship within said casing, each of said impeller chambers including a plenum space located on the upper portion thereof, a sea-water channel located in the lower portion thereof to communicate with said plenum space, said sea-water channel having both ends opened into the exterior of said casing, an impeller disposed therein such that an upper portion thereof is located in said plenum space and the substantial portion of its lower half is located in said sea-water channel, and a rotary shaft for said impeller running slightly above and in parallel to an interface between the plenum space and the sea-water channel, said rotary shaft having both end portions extending externally of said impeller chamber, fluid compression means disposed on either side of said impeller chamber externally thereof to be operatively coupled to each end of said rotary shaft, and a U-shaped bank means having a pair of legs of the U bridged by said casing, the arrangement being such that, with said casing and said U-shaped bank means partly submerged in the sea to project the upper portions thereof above the surface of the sea, a sea water pool is formed between said casing and said U-shaped bank means to communicate with the outer sea water only through said sea-water channels and that sea waves overflowing said upper projecting portion of said bank means flow through said sea water channels to drive the associated impellers to cause said fluid compressor means to produce a high pressure fluid from the air.

4,060,345

SUBMERSIBLE PUMP WITH GUIDE MEANS

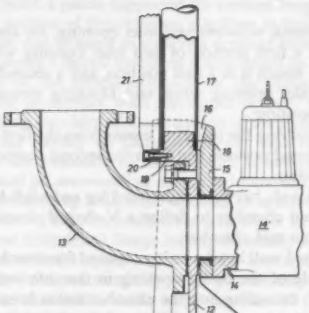
Albert Blum, Scheiderhoehe, Lomar, Germany

Continuation-in-part of Ser. No. 203,304, Nov. 30, 1971, Pat. No. 3,861,834. This application May 15, 1974, Ser. No. 470,078

Claims priority, application Germany, Jan. 30, 1970, 2004168

Int. Cl.² F04B *17/06, 35/04*

U.S. Cl. 417—360 **18 Claims**



1. A submersible electric motor-pump assembly having a drive motor and a pump connected therewith, which is lowerable into a body of fluid with the outlet of said pump being guided into engagement with a discharge pipe, comprising: guiding means in the form of a single element of circular cross-section and co-operatively associated male and female secondary aligning elements of mating rib and slot configurations, one of which is part of a fixed stationary reference and the other being a part of said moveable motor-pump assembly and being disposed about said guiding means of circular cross-section; and said male and female aligning elements together being adapted to co-operatively align the outlet of said motor-pump assembly with said discharge pipe as said assembly is brought into proximity to the outlet of said pump, whereby alignment of the motor-pump assembly with said discharge pipe is achieved by said aligning elements shortly before said motor-pump assembly reaches its lowest travel position.

4,060,346

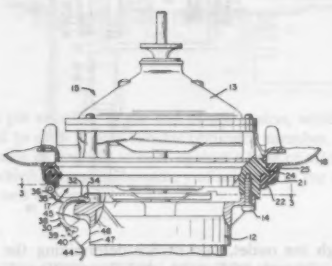
DISHWASHER MOTOR/PUMP MOUNTING MEANS

Theodore F. Meyers, Troy, Ohio, assignor to Hobart Corporation, Troy, Ohio

Filed July 27, 1976, Ser. No. 708,927

Int. Cl.² F04B *17/00, 35/00*

U.S. Cl. 417—360 **12 Claims**



1. For use in a dishwasher for resiliently retaining a motor/-pump assembly within the dishwashing tank, the bottom of the tank having an opening for receiving the motor/pump assembly therein, and the motor/pump assembly having a seat portion dimensioned to engage the sides of the tank opening to support the motor/pump assembly thereon, the improvement comprising:

a. at least one spring member having a hook portion along the length thereof, and

b. a pivot post on the motor/pump assembly for receiving and retaining said spring member hook portion, said hook portion being dimensioned to fit around said post with said spring member below the tank and in compression between the bottom of the tank and the motor/pump assembly to place a substantially constant downward force on the motor/pump assembly to secure the seat portion thereof on the sides of the tank opening.

4,060,347

LIQUID FUEL PUMPING APPARATUS

Boaz Antony Jarret, Sevenoaks, England, assignor to Cav Limited, Birmingham, England

Filed Sept. 2, 1976, Ser. No. 720,090

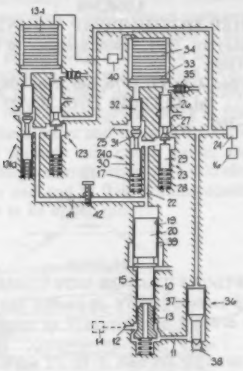
Claims priority, application United Kingdom, Sept. 16, 1975, 37968/75

Int. Cl.² F04B *17/00*

U.S. Cl. 417—392 **4 Claims**

1. A fuel injection pumping apparatus comprising a cylinder, a displacement piston located in said cylinder, a fuel outlet from one end of said cylinder, an inlet through which fuel can be admitted to said one end of the cylinder, a further cylinder, a fluid pressure operable member mounted within said further cylinder for moving said piston towards said one end of the first-mentioned cylinder thereby to cause fuel flow through said outlet, means operable upon movement of the piston to a predetermined position in said first-mentioned cylinder during delivery of fuel through said outlet to terminate flow of fuel through the outlet, valve means operable to place an end of said further cylinder in communication with a source of fluid under pressure to effect movement of the displacement piston in a direction to cause delivery of fuel through said outlet, further valve means operable to place said one end of the further cylinder in communication with the source of fluid under pressure to effect movement of the displacement piston in a direction to deliver fuel through said outlet, the apparatus also including a restricted orifice interposed between said

further valve means and said one end of said further cylinder, whereby said further valve means may be operated before said first-mentioned valve means when it is required to supply fuel



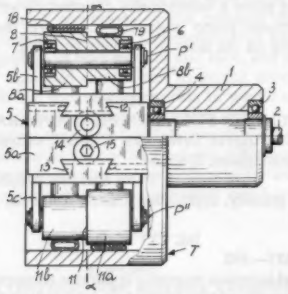
through the outlet, said orifice determining the rate of fuel supply through said outlet, said firstmentioned valve means being operated when the full rate of fuel supply through said outlet outlet is required.

4,060,348

ROLLER PUMP CARRYING OUT ALTERNATE PUMPING OPERATIONS, PARTICULARLY SUITED TO EXTRA-CORPOREAL BLOOD CIRCULATION

Luciano Della Bianca, Voghera, Italy, assignor to Bioengineering Research S.A., Luxembourg

Filed June 23, 1976, Ser. No. 699,203
Claims priority, application Italy, July 1, 1975, 24991/75
Int. Cl.[2] F04B *43/08, 43/12, 45/06*
U.S. Cl. 417—475 **7 Claims**



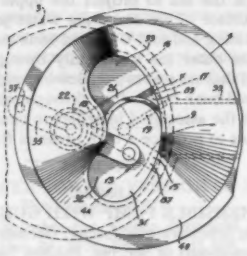
1. A rotary roller pump for carrying out sequential pumping of fluid in a plurality of separate squeezable tubings, the pump comprising a plurality of tubings; a stator, having an inwardly facing seating and a rotor which is provided at opposite lateral ends with respective rollers, for engagement with the said tubings; a gap provided between said rotor and said inwardly facing seating of said stator, which seating partially surrounds said rotor, for accommodating said tubings which are arranged substantially parallel to each other and extend in a general circumferential direction; and wherein each said roller includes two cylindrical and coaxial parts having different diameters, each said cylindrical part having the larger diameter being engageable with a respective one of said tubings between that cylindrical part of larger diameter and the inwardly facing seating for exerting a pumping action on that tubing when said rotor rotates, and that each said cylindrical part having the smaller diameter being in supportive and non-pumping engagement with a different one of said tubings, which is adjacent that one engaged by said cylindrical part of larger diameter, the repsective positions of said rollers being reversed so that each of said tubings is engaged with a respective one of said cylindrical parts of larger diameter and a respective one of said parts of smaller diameter forming part of a different one of said rollers.

4,060,349

CONTINUOUS FLOW, OSCILLATING PISTON MEAT PUMP

Ludwig Piereder, Pierrefonds, Canada, assignor to L. P. Machinery Ltd., Canada

Filed Oct. 13, 1976, Ser. No. 731,927
Claims priority, application United Kingdom, Oct. 14, 1975, 42059/75
Int. Cl.[2] F04C *21/00*; F04B *15/02*
U.S. Cl. 417—482 **7 Claims**



1. A continuous flow pump comprising:
a hollow chamber enclosed by a top wall, a bottom wall and a side wall;
an inlet opening in said top wall and an outlet opening in said side wall;
blocking means, adjacent said inlet opening, for alternately blocking a first portion of said inlet opening when said blocking means is in a first position, and a second portion of said inlet opening when said blocking means is in a second position;
means for moving the blocking means from the first position to the second position and from the second position to the first position;
a V-shaped wall, having a right-hand leg and a left-hand leg, within said chamber to define a V-shaped chamber portion within said chamber;
said V-shaped wall having its legs, spaced from each other at either side of the outlet opening in the side wall of the chamber, extending into the chamber towards each other and meeting at an apex disposed in the chamber and spaced from the side wall thereof;
each leg being equal in height to the height of the chamber;
flap means between said legs in the V-shaped chamber portion and being freely movable from one leg to the other;
an opening extending through each one of said legs;
said flap means being disposed to cover the opening in the wall against which it is adjacent;
a vane disposed in said chamber and outside said V-shaped chamber portion and being movable from one position, adjacent said right-hand leg, to a second position adjacent the said left-hand leg, and from the second position to the first position;
means for moving said vane from the first position to the second position and from the second position to the first position;
said vane extending from the center of the chamber to the side wall thereof; and
means for providing a space of reduced pressure in said

chamber behind said vane in the direction of travel thereof.

4,060,350

CYLINDER HEAD MOUNTING ARRANGEMENT FOR A DIESEL INJECTION PUMP

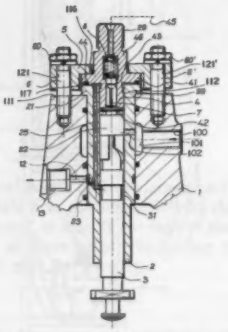
Jaromir Indra, Brno, Czechoslovakia, assignor to Vysoke uceni technicke, Brno, Czechoslovakia

Filed Mar. 29, 1976, Ser. No. 671,117

Claims priority, application Czechoslovakia, Mar. 27, 1975, 2105/75

Int. Cl.² F04B 7/04

U.S. Cl. 417—490 **5 Claims**



1. In an injection pump assembly, an elongated, vertically disposed hollow pump body, a working cylinder supported vertically within the pump body, the cylinder terminating upwardly in an extension projecting axially beyond the upper surface of the pump body, the extension having a laterally projecting shoulder in contact with the upper surface of the pump body, a piston supported for vertical reciprocation in the lower portion of the cylinder, a hollow cylinder head having an upper end adapted to receive a pressure fitting, the cylinder head having a lateral extension intermediate its ends, the lower surface of the lateral extension of the cylinder head being disposed in contact with the upper surface of the laterally projecting shoulder of the extension of the cylinder, the cylinder head having an elongated lower end tightly received within the extension of the cylinder to define therewith an elongated pressure-sealing zone, the lower end of the cylinder head terminating within the cylinder in spaced relation to the upper end of the piston when the piston is in its upper position, a hollow cylindrical flange having a radially inner portion in contact with the upper surface of the lateral extension of the cylinder head and a radially outer portion disposed in spaced, superposed relation to the upper surface of the pump body outwardly of the projecting shoulder on the axial extension of the cylinder, and means for securing the radially outer portion of the flange to the upper portion of the pump body.

4,060,351

CONTROLLED INLET VALVES FOR METERING PUMPS

Jean Cloup, 33360 Latresne, France

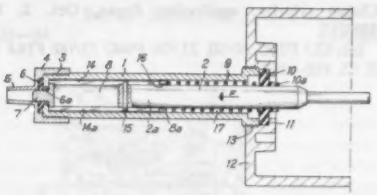
Filed Mar. 1, 1976, Ser. No. 662,584

Claims priority, application France, Mar. 5, 1975, 75.06915

Int. Cl.² F04B 7/00

U.S. Cl. 417—520 **3 Claims**

1. A controlled inlet valve for a metering pump, said pump comprising a cylinder having an inlet opening and an outlet opening, a piston moveable in said cylinder, and means for imparting a reciprocating movement to said piston, wherein a member is mounted to slide in said pump cylinder, one of the ends of said member having an obturator which cooperates with a sealing gland arranged at the inlet opening to said cylinder, said slidable member being selectively coupled at its other end to the piston and being subject to the urging of an elastic member which is capable of thrusting said obturator back to the closed position, said sliding obturator member being tubular and containing at least one longitudinal slot in which is



engaged a pin attached to the end of said piston, which piston is mounted to slide in said tubular obturator member, said pin being capable of coming to bear against a base of said tubular member which forms the boundary of said slot at the opposite end from said obturator.

4,060,352

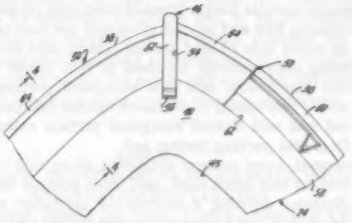
SEALING GRID SYSTEM FOR ROTARY PISTON MECHANISM OF THE WANKEL TYPE

George H. Woodier, Ringwood, and Robert E. Mount, Mendham, both of N.J., assignors to Curtiss-Wright Corporation, Wood-Ridge, N.J.

Filed Oct. 14, 1976, Ser. No. 732,412

Int. Cl.² F01C 19/04, 19/08; F04C 27/00

U.S. Cl. 418—122 **5 Claims**



1. In a rotary mechanism comprising a rotor having opposite side faces and peripheral surfaces intersecting each other to form apex portions and which rotor is supported for rotation within a cavity formed by a peripheral wall and opposite end walls of a housing, an apex seal means, including blade means at each apex portion to engage said peripheral wall, side seal assembly carried in at least one side face of the rotor for sealing the interstices between the one side face and the adjacent end wall of the housing and substantially isolating the working chambers formed by the rotor and said cavity, the side seal assembly comprises:

a. a plurality of recesses in said one side face of the rotor;

b. each recess extending in said one side face and along the juncture of the one side face and a peripheral surface between next adjacent apex seal means;

c. a seal member slidably receivable in each of the recesses and dimensioned to extend between and in sealing abutting relation with next adjacent apex blade means;

d. each seal member having a wear surface for engaging the adjacent housing end wall;

e. a groove in each of said recesses; and

f. a biasing member having two resilient leg portions disposed in each groove to bias the associated seal member in a direction outwardly of the recess and its wear surface in contact with the adjacent housing end wall and simultaneously effecting a seal of the space between the recess and its associated seal member.

V 9 6 4 / 5 N 0 2 9 7 7 7 UMI

4,060,353

ROTARY PUMP FOR HOT PITCH, ASPHALT AND LIKE VISCOUS SOLIDIFIABLE MATERIAL

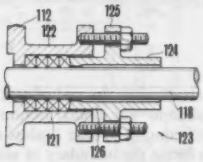
Minoru Akimoto, No. 17, Kanekodaira, Azumada, Iwaki, Fukushima, and Masaharu Tomizawa, No. 60-1, Sagiuchi, Nishiki, Iwaki, Fukushima, both of Japan

Filed Oct. 4, 1976, Ser. No. 729,258

Claims priority, application Japan, Oct. 2, 1975, 50-133993[U]

Int. Cl.² F01C *19/00, 21/04;* F04C *15/00;* F16J *15/18*

U.S. Cl. 418—102 3 Claims



1. In a rotary pump for pumping hot, viscous, solidifiable material, having a housing provided with an inlet for receiving said material and an outlet, a drive shaft extending into said housing, an impeller mounted on said drive shaft and rotatably disposed within said housing to displace said material from said inlet to said outlet, and an elongated packing casing extending about a portion of said drive shaft for sealingly holding a packing material about said drive shaft and having a first annular flange at one end thereof, the improvement comprising a packing gland disposed about said drive shaft and adjacent to said packing casing and having:

an elongated body extending about said drive shaft;

a second annular flange disposed externally on said body and defining first and second elongated portions of said body on either side of said second flange, said second flange being cooperatively attached to first flange to position said gland with said first elongated portion extending within said casing in abutment against said packing material and said second elongated portion extending away from said packing casing; and

a stepped, inner passage extending along said body for receiving said drive shaft, said inner passage having a first diameter defining a constricted clearance around said drive shaft and a second diameter defining a second clearance of approximately twice as large as the constricted clearance, said constricted clearance being of a predetermined length and being provided adjacent to the end of said first elongated portion extending within said packing casing, and said second clearance extending the remaining length of said first elongated portion and the total length of said second elongated portion,

said stepped, inner passage providing a clearance around said drive shaft of a length sufficient to allow viscous material leaking past said packing material to solidify and be ground to powder by rotation of said drive shaft.

4,060,354

APPARATUS FOR PRE-EXPANDING AND MOLDING EXPANDABLE THERMOPLASTIC POLYMER PARTICLES

Stuart B. Smith, Chelmsford, Mass., assignor to Foster Grant Co., Inc., Leominster, Mass.

Continuation-in-part of Ser. No. 288,230, Sept. 11, 1972, abandoned. This application July 22, 1975, Ser. No. 598,508

Int. Cl.² B29D *27/00*

U.S. Cl. 425—4 R 2 Claims

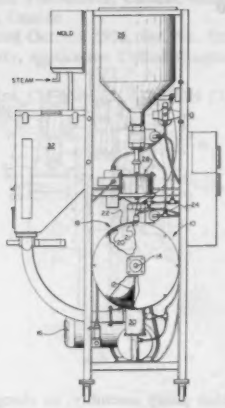
1. Apparatus for partially expanding expandable thermoplastic polymer particles containing a blowing agent comprising:

a. a horizontally mounted substantially closed cylindrical vessel;

b. means operatively connected with said vessel for inserting a measured amount of said expandable particles within said vessel;

c. means connected to the walls of said vessel for heating the vessel walls for heating the particle within to soften the polymer particles and volatize the blowing agent causing partial expansion of said particles during their residence in said vessel;

d. continuously driven agitating means mounted thereon and extending axially of said vessel for repeatedly wiping the particles within the vessel against the side walls thereof and then returning said particles toward the center thereof before being wiped once more against said side walls;



e. means connected with said vessel for supplying a substantially dry pressurized gaseous medium to said vessel to increase the pressure on said particles within while in their heat softened state to superatmospheric, said pressure being adequate to substantially prevent further expansion of the particles after a predetermined amount of pre-expansion to obtain the desired uniform density thereof; and

f. means for discharging the particles from the vessel including an exit opening in said vessel through which the gaseous medium may carry the particles from said vessel.

4,060,355

DEVICE FOR THE MANUFACTURE OF FIBERS FROM FUSIBLE MATERIALS

Alfred H. Walz, Emmendingen, and Paul-Jürgen Hahn, Karlsruhe-Durlach, both of Germany, assignors to Firma VKI-Rheinhold & Mahla AG, Mannheim, Germany

Division of Ser. No. 384,565, Aug. 1, 1973, Pat. No. 4,001,357. This application Oct. 6, 1976, Ser. No. 730,084

Claims priority, application Germany, Aug. 2, 1972, 2237884

Int. Cl.² B29C *23/00;* B22D *23/08*

U.S. Cl. 425—7 7 Claims

1. An apparatus for the manufacture of fibers from fusible low viscosity melts of inorganic mineral or metal materials or organic materials, comprising:

crucible means for heating the starting material above the melting point thereof and having an orifice in the bottom thereof;

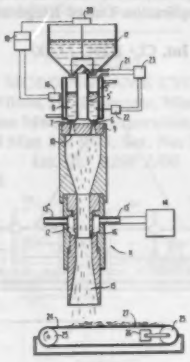
Laval nozzle means for causing abrupt temperature drop of gases passing therethrough at supersonic speeds and being disposed in relation to said orifice to receive liquid passing therethrough;

means for permitting a gaseous flow medium to enter the inlet of said Laval nozzle means; and

flow control means for causing said flow medium to pass through said Laval nozzle means at supersonic speed;

wherein said Laval nozzle means comprises a Laval nozzle

having a narrow inner diameter part and an enlarged inner diameter part downstream of said narrow part, the shape of said enlarged part being so selected so as to achieve a sufficient temperature drop of the flow medium within a



sufficiently short length of the enlarged part of said Laval nozzle, when said flow medium is flowing therethrough at a supersonic speed, to solidify the melt of starting material into the form of fibers before the surface tension of the melt forms the melt into droplets.

4,060,356

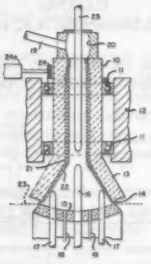
APPARATUS FOR MAKING BEADS

Charles W. Schott, 175 Carmella Drive, McKeesport, Pa. 15131

Continuation of Ser. No. 515,191, Oct. 16, 1974, abandoned, which is a continuation-in-part of Ser. No. 291,262, Sept. 22, 1972, Pat. No. 3,856,899, which is a continuation-in-part of Ser. No. 35,962, May 11, 1970, Pat. No. 3,694,528. This application Apr. 27, 1976, Ser. No. 680,692

Int. Cl.² B29C *23/00*

U.S. Cl. 425—8 **13 Claims**



1. An apparatus for making spherical pellets comprising a member including a central axial conical surface about a generally vertical axis having at the cone base a continuous generally circular outer peripheral edge, means continuously depositing a layer of material onto said central axial conical surface, means creating heat on said central axial conical surface sufficient to maintain said layer of material in a molten condition, means forming at least a part of said central axial conical surface imparting motion to said layer of material along and away from said vertical axis, whereby said outer peripheral edge is operable to discharge molten material generally radially in the form of spherical pellets, and fluid cooling means adjacent to and below said peripheral edge receiving said radially discharged pellets discharged from said edge while still at least partially molten at an angle such that the molten pellets enters the fluid cooling means retaining their spherical shape and solidifying the same by cooling in said fluid cooling means.

4,060,357

PNEUMATIC TIRE MANUFACTURE

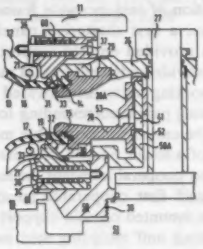
Bernard Charles Allitt, Sutton Coldfield, England, assignor to Dunlop Limited, England

Filed Sept. 22, 1976, Ser. No. 725,577

Claims priority, application United Kingdom, Oct. 2, 1975, 40284/75

Int. Cl.² B29H *5/02*

U.S. Cl. 425—36 **2 Claims**



1. A mould for the manufacture of a pneumatic tire having a bead diameter which, in the green state of the tire, is slightly smaller than that of the finished tire, the mould having a support ring for a bead of the tire which ring is variable in dimensions between a fully expanded condition in which the outer periphery of the ring is substantially uninterrupted and is of diameter substantially equal to the diameterof the bead of the finished tire and a retracted condition in which the dimensions of the ring are reduced sufficiently to permit the unobstructed mounting thereover of the bead of the green tire, means to bias the ring to its retracted condition and to be overcome by curing pressure in operation of the mould whereby the ring adopts its expanded condition automatically upon application of curing pressure within the mould and automatically resumes its retracted condition when curing pressure is relieved.

4,060,358

CLIMBING SCAFFOLDING ASSEMBLIES WITH ASSOCIATED SHUTTERING

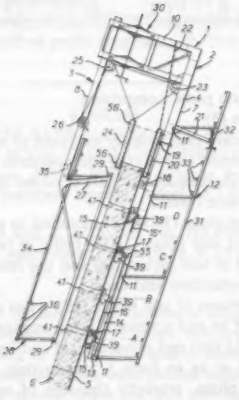
Bernard Fougea, Neuilly-sur-Seine, France, assignor to Coignet S.A., France

Filed May 28, 1976, Ser. No. 691,212

Claims priority, application France, June 5, 1975, 75.17557

Int. Cl.² E04G *11/04*

U.S. Cl. 425—65 **12 Claims**



1. A climbing scaffolding assembly for in situ casting a rein-

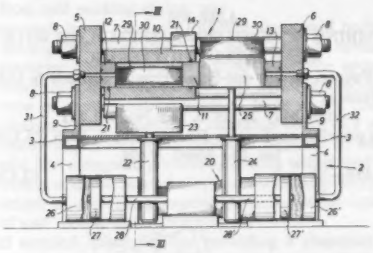
forced concrete wall in successive superposed layers of variable inclination, said assembly comprising a scaffolding unit of generally inverted U-shaped configuration including a support frame adapted to be disposed to one side of a wall in construction and to bear against the one wall side only, a cantilever member disposed at an end of said support frame for defining headspace above the top of a wall portion previously cast and a movable frame suspended from said cantilever member and generally parallel to and spaced from said support frame, means operatively associated with said movable frame for adjusting the position of said movable frame with respect to said support frame, a first shuttering panel and first set of working catwalks provided on said support frame, a second shuttering panel provided adjacent to said movable frame and a second set of working catwalks provided on said movable frame, said shuttering panels corresonding to opposed sides of a wall portion to be cast, first cooperable means securable to the said one side of a lower portion of a previously cast wall portion and second cooperable means on said support frame cooperable with said first cooperable means and associated with motor means mounted on said support frame for lifting the entire scaffolding unit including said support frame and said movable frame, said cantilever member, said first and second shuttering panels and said first and second sets of catwalks all in unison from a level corresponding to a last-poured layer of concrete to a lever corresponding to the layer of concrete to be poured next.

4,060,359

ISOSTATIC PRESS

Sten Trolle, and Åke Jonson, both of Ystad, Sweden, assignors to AB Carbox, Ystad, Sweden

Filed Feb. 9, 1977, Ser. No. 766,876
Claims priority, application Sweden, June 10, 1976, 7606596
Int. Cl.² B30B *5/02, 11/00*
U.S. Cl. 425—78 **15 Claims**



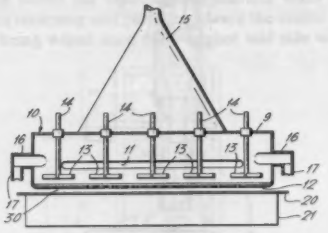
1. An isostatic press, comprising
frame means (3);
a tubular jacket (10) slidably mounted to said frame means (3), said jacket (10) having end apertures and being longitudinally displaceable at least between two end positions on said frame means;
at least three plugs (11,12,13) mounted to said frame means (3), two of said plugs (12,13) being at respective ends of the travel of said jacket (10) and the remaining plug (11) being intermediate said ends;
the end apertures of said jacket (10), when said jacket (10) is in each of its end positions, being engaged and closed by one of said two end plugs (12,13) and by an intermediate plug (11) so as to form a pressurizing vessel with said engaged plugs, whereby the side of said frame means which is free of said jacket (10) may be charged in preparation for a pressurizing operation thereat.

4,060,360

APPARATUS FOR DRY FORMING A LAYER OF FIBER

Frederick Tapp, Bristol, England, assignor to Karl Kroyer St. Anne's Limited, Bristol, England

Filed Apr. 20, 1976, Ser. No. 678,600
Claims priority, application United Kingdom, May 29, 1975, 23369/75
Int. Cl.² B29C *13/00*
U.S. Cl. 425—83 **9 Claims**



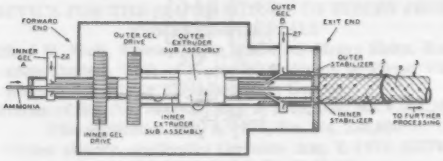
1. Apparatus for drying forming a layer of fibre and comprising a distributor box having an inlet for fibres and a fixed perforated bottom wall, a foraminous forming surface which is spaced below the bottom wall, is movable past the distributor box and is arranged to receive the fibers through the bottom wall under the influence of suction exerted by a suction system connecting with the underside of the forming surface, wherein obturating means are disposed at an air gap between the bottom wall and the forming surface, which obturating means comprise a plurality of obturators positioned along the periphery of the air gap which are adjustable to provide variation in positions wherein laterally inward air flow through the periphery of the air gap is obstructed and positions wherein air openings are provided for laterally inward air flow through the periphery of the air gap.

4,060,361

EXTRUDER APPARATUS FOR FORMING A TUBULAR CASING

Francis Joseph Ziolko, Somerville, N.J., assignor to Devro, Inc., Somerville, N.J.

Filed Jan. 16, 1975, Ser. No. 541,465
Int. Cl.² B29D *23/04*
U.S. Cl. 425—131.1 **5 Claims**



1. An apparatus for forming a tubular collagen casing comprising:
a. a stationary frame;
b. a stationary member mounted on said frame;
c. an inner hollow extruder member mounted on said frame, said inner hollow extruder member having a plurality of radially extending orifices therethrough for directing collagen outwardly;
d. means for mounting said inner extruder member on said frame concentric with respect to said stationary member and spaced outwardly therefrom;
e. an outer extruder member having a plurality of radially extending orifices therethrough for directing collagen inwardly;
f. means for mounting said outer extruder member on said frame concentric with respect to said inner extruder mem-

V 964/5 NO 29 77 UMI

ber and spaced outwardly therefrom to form a passageway therebetween for merging said collagen of said inwardly and outwardly directions; and

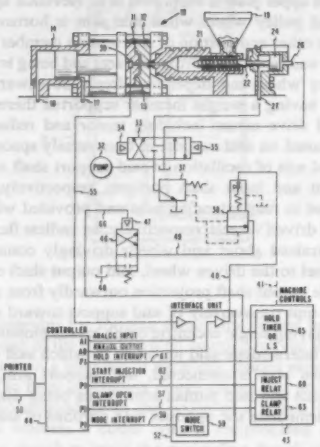
g. means for rotating said inner extruder member in one direction and means for rotating the outer extruder member in the opposite direction.

4,060,362

INJECTION MOLDING SAME CYCLE CONTROL

Charles Eugene Wilson, III, Rochester, Minn., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed May 12, 1975, Ser. No. 576,518
Int. Cl.² B29F 1/06
U.S. Cl. 425—145 7 Claims



1. An injection molding machine including hydraulically driven reciprocating ram for injecting plasticized material from an injection barrel into a mold cavity and a control system comprising;

hydraulic pressure fluid circuit means operable to advance said ram;

pump means operatively connected to said fluid circuit means to deliver hydraulic fluid to said ram;

electrically responsive valve means connected to said fluid circuit means for controlling delivery of hydraulic fluid from said pump means to said ram;

a sensor responsive to the fluid pressure of material within said mold cavity;

sensing means connected to the output of said sensor for periodically sensing signals which are a function of cavity pressure encountered by said sensor;

accumulating and averaging means connected to said sensing means for receiving and averaging a series of signals representative of cavity pressure commencing with the attainment of a predetermined cavity pressure and terminating with a second event to produce a sensed average value;

means to produce a reference pressure value;

comparison means operable to compare said sensed average value with said reference value to generate an error signal;

means operable to control said valve means for modifying the hydraulic system pressure driving said ram during the same cycle of machine operation following said second event, by an increment which is a function of the sign and magnitude of said error signal;

error signal compare means connected to receive said error signal and generate an output signal when said error signal exceeds a predetermined magnitude; and

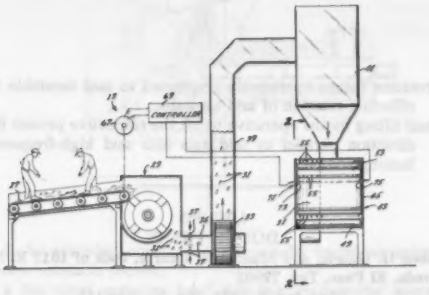
disabling means responsive to said error signal compare means which inhibits alteration of the fluid pressure driving said ram by said means for modifying the hydraulic system pressure, during a cycle in which a signal is generated by said error signal compare means.

4,060,363

APPARATUS FOR MAKING STABLE BLOCKS FORMED OF SHREDDED PAPER-LIKE MATERIAL

Gerald B. Nelson, San Diego, Calif., assignor to Papakube Corporation, San Diego, Calif.

Division of Ser. No. 382,817, July 26, 1973, Pat. No. 3,949,036.
This application Nov. 20, 1975, Ser. No. 633,948
Int. Cl.² B29C 3/06
U.S. Cl. 425—147 20 Claims



1. An apparatus for making stable blocks of paper comprising:

a first conveyor;

means for supplying paper fragments to said first conveyor;

said first conveyor moving the paper fragments along a first path;

a pickup conveyor for removing paper fragments from the first conveyor and moving the paper fragments along a second path which extends upwardly from the first conveyor, said second path forming an obtuse angle with the first path;

means defining an open zone extending downwardly from the upper end of said pickup conveyor whereby the paper fragments fall from the upper end of the pickup conveyor through said zone;

means for directing a liquid into said zone beneath the upper end of said pickup conveyor;

means for transporting the paper fragments from said zone-defining means;

means downstream of said directing means for compacting the paper fragments; and

means downstream of the compacting means for compressing the compacted paper fragments to form stable blocks of paper.

4,060,364

APPARATUS FOR FABRICATING MOLDED ARTICLES USING HIGH-FREQUENCY HEATING

Elie Gras, Maisons Alfort, France, assignor to Societe Immobiliere et Financiere Suchet Alfort (S.I.F.S.A.), Paris, France

Filed Aug. 2, 1976, Ser. No. 710,475
Claims priority, application France, Aug. 9, 1975, 75.27466
Int. Cl.² B29C 1/12
U.S. Cl. 425—174 10 Claims

1. An apparatus for fabricating molded articles by high-frequency heating of plastic under pressure, comprising:

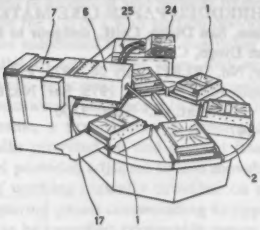
a turntable having an edge and an axis of rotation;

a series of independent diaphragm presses supported on said turntable and spaced from the axis of rotation of said turntable;

a fixed high-frequency heating station positioned above and

in vicinity of the edge of said turntable and into which each press in turn is fitted for heating;

cooling means operatively coupled to said presses for cooling said presses subsequent to the respective heating thereof in said high-frequency heating station;



rotation means operatively connected to said turntable for effecting rotation of said turntable;

and lifting means operative to lift the respective presses in a direction parallel to said axis into said high-frequency heating station.

4,060,365

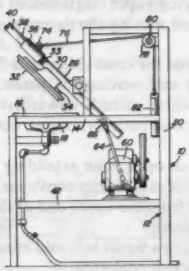
DOUGH PRESS

Ruben G. Duarte, and Manuel G. Duarte, both of 1012 E. Nevada, El Paso, Tex. 79902

Filed Apr. 8, 1975, Ser. No. 566,115

Int. Cl.[2] A21C *9/00*

U.S. Cl. 425—214 **1 Claim**



1. A dough press comprising a support having front, rear and opposite side portions and including a lower stationary horizontally oriented plate supported from the front portion of said support, a single generally horizontal front to rear extending support arm spaced above and extending over said lower plate, the front end portion of said arm disposed over said lower plate having an upper plate suspended therefrom closely overlying said lower plate, said upper and lower plates having heating means operatively associated therewith for heating said plates, said opposite side portions including elevated rear portions from which a pair of horizontally aligned journals are supported, the rear end portion of said arm disposed to the rear of said plates including a horizontal transverse support shaft oscillatably supported from said journals for oscillation about a horizontal axis extending transversely of said rear end portion of said arm and said support, motorized drive means carried by a lower rear portion of said support and including a slow turning rotatable output shaft, single pitman arm means pivotally eccentrically connected to said output shaft to one end and removably pivotally connected to the rear end of said arm at the other end thereof rearward and on the side of said axis remote from said upper plate for oscillation of said arm and swinging movement of said upper plate about said axis toward and away from said lower plate in response to rotation of said output shaft, gravity type counterbalance means operatively connected to said support arm over-balancing said arm, when the latter is in a horizontal position, for upward swinging of the front end portion of said arm from which said upper plate is suspended and thus said upper plate, away from said lower plate, the front end portion of said arm from which said upper plate is suspended having an elongated handle removably supported therefrom and projecting endwise outwardly thereof, said support including an elevated rear transverse portion extending between said elevated rear portions of said opposite side portions, disposed above the elevation of said axis and from which a pulley wheel is journaled for rotation about a horizontal transverse axis, said counterbalance means including an elongated flexible tension member having one end portion thereof anchored to the front end portion of said arm from which said upper plate is supported at an elevation appreciably below said pulley wheel when said arm is horizontally disposed, the other end portion of said tension member extending upwardly and rearwardly from said arm and being trained over said pulley wheel and depending freely downwardly therefrom and having a weight member supported therefrom, said motorized drive means including motor and reduction gear units mounted on said support in transversely spaced relation below said axis of oscillation of said support shaft and including output and input shaft portions, respectively, rotatable about front to rear extending axes and provided with aligned drive and driven wheels, respectively, an endless flexible drive member trained about said wheels drivingly connecting the drive wheel to the driven wheel, said output shaft comprising a rotatable output shaft projection outwardly from said reduction gear unit transversely of said support toward said motor unit and having single eccentric crank means mounted thereon centrally intermediate said units and to which said one end of said pitman arm is connected, said support arm, eccentric crank means and said pitman arm means being disposed centrally intermediate the opposite side portions of said support.

4,060,366

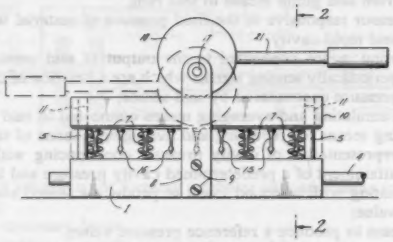
TUBE PERFORATOR

Sven Olof G. Johansson, 123 Winkler, Apt. 101, Houston, Tex. 77087

Filed Nov. 1, 1976, Ser. No. 737,498

Int. Cl.[2] B26F *1/14;* B29C *17/14*

U.S. Cl. 425—290 **5 Claims**



1. In a tube perforating device for forming perforations having outwardly extending margins, a lower member forming a base, said base having a groove in which a tube to be perforated may be mounted, said upper member being maintained yieldably above said base and movable downwardly against the base, needles adjustably mounted in said upper member, the extended ends thereof having an ovoid enlargement adjacent the point adapted to be forced through the first contacted wall of the tube, and perforate the second contact with the wall of the tube, forming diametrically opposed perforations.

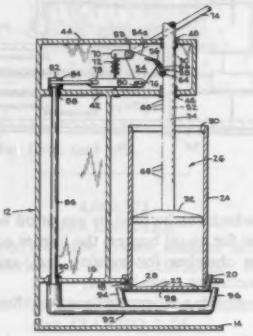
V 9 6 4 / 5 N 0 2 9 7 7 UMI

4,060,367

DRIVE MECHANISM FOR DOUGH SHAPING APPARATUS

Mounir A. Shatila, Blackfoot; John L. Veeneman, Idaho Falls; John H. Lach, and James F. Harmon, both of Blackfoot, all of Idaho, assignors to Ampco Foods Inc., San Francisco, Calif.

Filed Jan. 2, 1976, Ser. No. 646,332
Int. Cl.[2] A21C *11/10*
U.S. Cl. 425—311 8 Claims



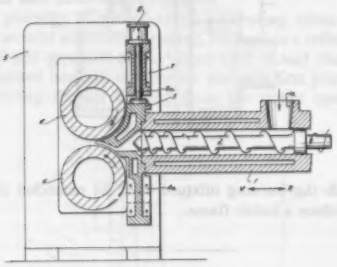
1. In apparatus for forming french fry shaped bodies from potato dough of the type in which dough is moved through the spaces between a plurality of parallelly spaced elongate members so as to form protruding dough pieces that protrude by a distance corresponding to the width of a french fry shaped piece and wherein a cutter wire is reciprocated across the protruding dough to sever the protruding dough pieces from the dough on the opposite side of the elongate members, the improvement comprising a piston for moving the dough toward said elongate members, an elongate rod secured to said piston, a plurality of uniformly spaced apart slots in said rod, each said slot having a concave cylindric surface extending transversely and chordally of said rod, the interval between adjacent slots being approximately equal to the width of a french fry shaped potato piece, a crank arm and means for supporting said crank arm for pivotal movement above a fixed pivot axis perpendicular to and spaced from said rod, said crank arm having a distal end spaced from said rod by an increment so that said distal end is intermediate said pivot axis and said rod, a yoke having a first end pivotally supported at said distal end and a free end spaced from the distal end by a distance greater than the increment, a cross pin mounted at said free end and extending in parallelism to said pivot axis and engagable with said notches, said cross pin being of cylindric shape and having a radius substantially equal to that of said notch surface so as to contact said notch surface over a substantial surface area, means for biasing said yoke relative said crank arm to effect engagement of said cross pin with the notches in said shaft, means for rocking said crank arm in an arc less than 360° to produce a power stroke so that said cross pin moves said rod and said piston toward the spaced apart elongate members, said distal end describing an arcuate path during said power stroke so that said crank arm and said yoke pass through a dead center position during said power stroke, said cross pin, said distal end and said pivot axis residing in coplanar relation at said dead center position so that further pivotal movement of said crank does not effect further movement of said rod and said piston, and means linked to said rocker arm for reciprocating said cutter wire, said reciprocating means acting to reciprocate said wire cutter only after said dead center position.

4,060,368

FLAT-SHEET INJECTION HEAD

Helmuth Theysohn, late of Wiehbergstrafe 25 C, 3 Hannover, Germany, by Ernestine Theysohn, administratrix

Division of Ser. No. 369,846, June 14, 1973, Pat. No. 3,895,898.
This application Jan. 27, 1975, Ser. No. 544,365
Claims priority, application Germany, June 19, 1972, 2229828
The portion of the term of this patent subsequent to July 22, 1992, has been disclaimed.
Int. Cl.[2] B29C *15/00*
U.S. Cl. 425—376 B 8 Claims



1. An extruder, comprising; an extruder barrel; an extruder screw rotatable therein;

a flat sheet extruder head defining an extruder aperture elongate transversely of said barrel, the head being disposed in use for extruding material in a plastic state from the barrel through the aperture into a nip of calender rolls, the extruder head comprising first and second, similarly elongate parts generally disposed on mutually opposite, elongate sides of said aperture;

rigid stationary means extending along said extruder head and rigidly stationarily supporting the first elongate part of said extruder head, the second elongate part of said extruder head being mounted on said barrel and being movable therewith toward and away from said rigid means; and

pressure means mounted on said rigid means and actuatable between said rigid means and said movable elongate part for releasably pressing at least a central portion of said movable elongate part toward said stationary elongate part to counteract distortion of the movable elongate part in the use of the extruder.

4,060,369

BURNER FOR THE COMBUSTION OF HYDROCARBONATES

Bernardus A. Schoute, Einsteinstraat 76, Nijmegen, and Gerardus H. Th. M. Verhoeven, Wilgenhoek 23, Zevenaar, both of Netherlands

Filed Apr. 23, 1975, Ser. No. 570,967
Claims priority, application Germany, Oct. 3, 1974, 7433163[U]
Int. Cl.[2] F23M *3/00*
U.S. Cl. 431—9 5 Claims

1. A method of burning liquid fuel with air so as to produce a long stable flame comprising:

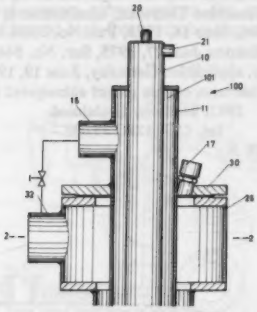
atomizing said fuel by swirling; mixing said fuel with primary air by introduction under pressure the primary air into a flow of said swirling fuel tangential to the direction of said flow and forming a confined cylindrical stream; releasing said confined stream;

introducing secondary air flowing parallel to said released stream into said confined stream;

expanding said released stream from a first to a second cross-section larger than said first cross-section during introduction of said secondary air; and

supplying tertiary air to said stream in a helical swirling path about the periphery of said second cross-section and

within a transition between said second cross-section and a larger cross-section so that said tertiary air is admixed



with the burning mixture over an extended distance to produce a stable flame.

4,060,370

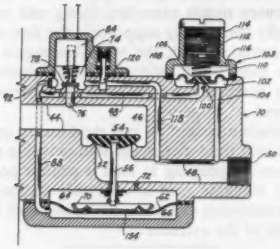
MANIFOLD GAS VALVE WITH STEPPED FLOW OPERATION

Thomas P. Fleer, Sunset Hills, Mo., assignor to Emerson Electric Co., St. Louis, Mo.

Division of Ser. No. 618,901, Oct. 2, 1975, abandoned. This application Sept. 7, 1976, Ser. No. 721,022

Int. Cl.² F23N *1/00*; F16K *31/12*

U.S. Cl. 431—62 **2 Claims**



1. In a gas valve device, a body member having an inlet for connection to a source of gas under pressure, an outlet for connection with a gas burner, main fuel passageway means connecting said inlet and outlet, and auxiliary fuel passageway means connecting said inlet and outlet, said main and auxiliary fuel passageway means jointly providing the full rated flow from said inlet to said outlet with said auxiliary passageway means alone providing sufficient fuel flow to support combustion at the burner, a biased closed main valve controlling flow through said main fuel passageway means, a flexible diaphragm forming the movable wall of an expansible chamber and operative upon expansion of said chamber to move said main valve openward, a normally closed control valve in said auxiliary passageway means controlling the flow therethrough, operating pressure passageway means leading from said auxiliary passageway means at a point downstream from said control valve to said expansible chamber, and means to retard the increase in pressure in said expansible chamber when said control valve is opened comprising a restricted flow passageway leading from said expansible chamber to said outlet providing a constant limited bleed off thereby to delay opening of said main valve.

4,060,371

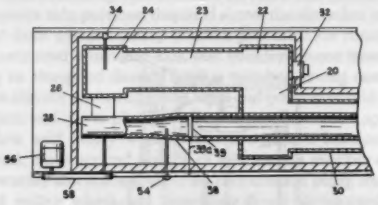
LIQUID OR GASEOUS FUEL FIRED BURNER

Charles B. Gentry, Grand Rapids, and William A. Phillips, Comstock Park, both of Mich., assignors to Granco Equipment, Inc., Grand Rapids, Mich.

Continuation-in-part of Ser. No. 397,606, Sept. 14, 1973, Pat. No. 3,949,053. This application Oct. 22, 1975, Ser. No. 624,997

Int. Cl.² B01D *53/34*

U.S. Cl. 431—75 **5 Claims**



1. A burner which can be fired by gas or oil without the use of secondary air for an oil burner, the burner comprising:

a combustion chamber for burning fuel, said combustion chamber including a gas burner;

means for supplying normally gaseous fuel to said gas burner;

a feed conduit communicating with said combustion chamber for passing oxygen-containing gas to said gas burner;

means for heat exchanging the oxygen-containing gas in said feed conduit with the hot exhaust from said combustion chamber to raise the temperature of said oxygen-containing gas above the vaporization temperature and below the preignition temperature of a liquid fuel;

a source of fuel which is liquid at ordinary temperature and pressure;

a means for injecting the liquid fuel directly into the feed conduit downstream of the heat exchange means so that the normally liquid fuel is vaporized as it is injected into the feed conduit;

means in the feed conduit between the injecting means and the gas burner for turbulating the gases in the feed conduit to evenly disperse and admix the vaporized normally liquid fuel with the oxygen-containing gas; and

means for igniting the vaporized fuel at the gas burner.

4,060,372

SELF-DEFENSE APPARATUS COMPRISING FLASHCUBE LIGHT SOURCE

Walter Beck, Hesligenstrasse 8, Kusnacht, Switzerland (8701), and Werner Bürk, Wilhelm Hachtel Str. 13, Musberg, Germany (7021)

Filed Aug. 4, 1975, Ser. No. 601,445

Claims priority, application Germany, Aug. 6, 1974, 2437763

Int. Cl.² F21K *5/02*

U.S. Cl. 431—93 **4 Claims**

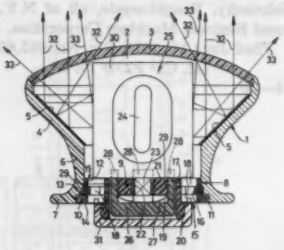
2. A self-defense apparatus comprising:

a housing dimensioned to be held in the hand;

a flash-cube light source in said housing having a plurality of flash lamps capable of generating flash of strength sufficient to temporarily blind a person; and

means on said housing for firing all of said lamps simultaneously, said housing, being axially symmetrical, has a narrow neck adapted to be held between two fingers on the same hand, said means for firing includes a button on one axial end of said housing operable by the thumb of a

user of the apparatus, said housing being provided on the opposite end with a transparent lens and wherein said



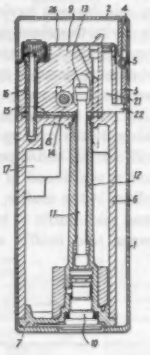
housing is provided internally with a frustoconical mirror tapering away from said lens.

4,060,373

GAS LIGHTER

Jean-Marie Paroty, Ableiges, France, assignor to Societe Franco-Hispano-Americaine (FRANCISPAM), Saint-Gratien, France

Filed Mar. 25, 1976, Ser. No. 670,102
Int. Cl.² F23Q *2/08*
U.S. Cl. 431—135 **15 Claims**



1. Lighter adapted to use a liquefied gas under pressure and comprising a casing, a cap for said casing movable between a closed rest position and an open rest position, a reservoir provided with a valve leading to a burner covered by said cap in said closed position, and an ignition mechanism comprising an abrasive wheel and a flint biassed against said abrasive wheel, said lighter further comprising a spring having three parts; a first part which is connected to the cap to hold it in either said open or said closed position, a second part which is adapted to be displaced by the movement of said first spring part and cooperates with said valve to open said valve during opening of said cap, and a third part which is at one end of said spring and cooperates with said flint to bias said flint against said abrasive wheel.

4,060,374

FUEL SAVING SYSTEM

Benjamin F. Kwait, 100 Old Cow Pasture Lane, Smoke Rise, Kinnelon, N.J. 07405

Filed June 8, 1976, Ser. No. 693,760
Int. Cl.² F23C *7/02*
U.S. Cl. 431—190 **1 Claim**

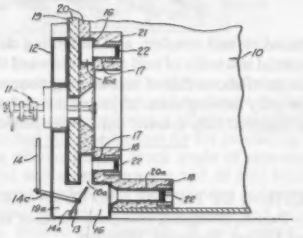
1. A boiler comprising:

a boiler including an elongated, tubular combustion chamber having a front wall and a rear wall;

a burner mounted on said front wall of said combustion chamber and disposed to direct the flame emitted therefrom, toward said rear wall of said combustion chamber;

a first plurality of spaced-apart, air-feeding tubes, each having an inlet and outlet opening, encased in a refractory material and mounted on said front wall of said chamber and spaced about the periphery of said burner, so as to direct the air flowing from the outlet openings thereof into the heart of the flame emitted by said burner and into the center of said combustion chamber;

a second plurality of spaced-apart, air-feeding tubes, each having an inlet and outlet opening, encased in a refractory material and mounted on said front wall of said chamber and disposed beneath said burner and said first plurality, for directing the air flowing from the outlet openings



thereof into the bottom portion of the flame emitted by said burner, so as to create turbulence therein;

a plurality of tubular refractory shields, each of which encases one of said air-feeding tubes adjacent the outlet opening thereof, and a plurality of louvered baffles, each of which covers the outlet opening of one of said air-feeding tubes, said refractory shields, louvered baffles, and refractory encasement of said tubes cooperating to superheat the air flowing through said tubes, prior to injection into said combustion chamber; and

means for supplying air under pressure to said inlet openings of said tubes, said means including a blower carried by said boiler, a windbox having an end connected with said blower, a damper connected with the other end of said windbox, and a metal duct connecting said damper with said inlet openings of said tubes, and a modulator carried by said boiler and operatively connected with said damper for regulating the flow of air therethrough.

4,060,375

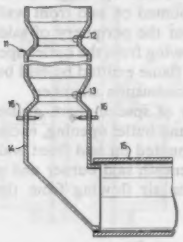
METHODS AND APPARATUS FOR THE HEAT TREATMENT OF FINE-GRAINED MATERIALS

Paul Weber, Oelde; Hans Möllenkopf; Kurt Henning, both of Neubeckum; Otto Heinemann, Ennigerloh; Heinz-Herbert Schmits, Rheda; Wolfgang Rother, Stromberg; Horst Ritzmann, Enniger; Jürgen Wurr, Enniger; Karl Krützner, Jr., Neubeckum; Werner Schössler, Ahlen; Wolf Goldmann, and Georg Schepers, both of Enniger, all of Germany, assignors to Polysius AG, Neubeckum, Germany

Division of Ser. No. 469,358, May 13, 1974, Pat. No. 3,940,236.
This application Jan. 12, 1976, Ser. No. 648,271
Int. Cl.² F27B *15/00*
U.S. Cl. 432—14 **14 Claims**

1. A method for the heat treatment of fine-grained material prior to firing said material in a furnace having a walled, vertical waste gas conduit, said method comprising conducting a waste gas stream from said furnace upwardly through said conduit at a predetermined velocity; supplying fine-grained material having a grain size so related to the velocity of said gas stream that no substantial portion of said material is entrained by said gas stream; introducing said material into said

conduit at a first level between its upper and lower ends so that said material will fall downwardly in opposition to said gas stream toward the lower end of said conduit; combusting fuel in said conduit at a second level below said first level to provide a heating zone below the level at which said material is



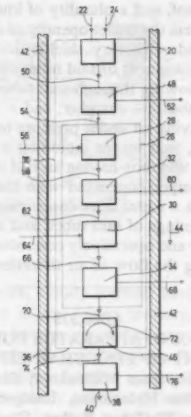
introduced to said conduit; and deflecting downwardly moving material inwardly of said conduit toward the center thereof and at a level above that of said heating zone to assure that said downwardly moving material passes through said heating zone as said material falls toward said lower end of said conduit.

4,060,376

METHOD OF FIRING AND FURNACE THEREFOR

Károly Perédi, Budapest, Hungary, assignor to Energiagazdalkodasi Intezet, Budapest, Hungary

Continuation of Ser. No. 605,319, Aug. 18, 1975, abandoned. This application Nov. 15, 1976, Ser. No. 741,988
Claims priority, application Hungary, Dec. 11, 1974, EE 2292
Int. Cl.² F23M *3/04;* F27B *1/10*
U.S. Cl. 432—24 **4 Claims**



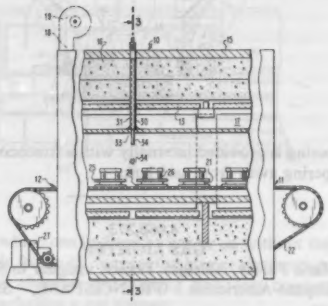
1. A method of firing for heat consuming equipment such as boilers and industrial furnaces comprising decomposing a fuel in a first stage in the presence of deficient amounts of primary combustion air so as to produce a hot combustible gas, gradually combusting said hot combustible gas in a second stage by means of secondary combustion air also in deficient amount for complete combustion and in a third stage with tertiary air in an amount for complete combustion, and exhausting said combustion gases with heat withdrawal, cooling down said hot combustible gas by at least 50° C. to a temperature of more than 650° C. prior to introducing said secondary combustion air, and mixing said combustion gases without heat withdrawal at a temperature of more than 650° C. prior to their being exhausted.

4,060,377

TEMPERATURE MONITORING FURNACE

LeRoy Richard Hentz, Hyde Park; Gary Frank Pavlovic, Beacon; Angelo James Scarafino, Wappingers Falls, and John Joseph Seksinsky, Poughkeepsie, all of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed June 14, 1976, Ser. No. 695,603
Int. Cl.² F27D *19/00*
U.S. Cl. 432—50 **8 Claims**



1. Apparatus for monitoring product temperature in a furnace; comprising in combination: an open ended furnace of the secondary emission type having a plurality of serially arranged heating zones therein, said furnace having an outer casing and an inner muffle with a cavity therebetween, means for applying heat to said cavity in each of said zones to heat said muffle, and at least one conveyor passing through said muffle for carrying product thereon through said furnace; open ended tubes passing through said casing into said muffle and attached thereto; and temperature sensing means passing through at least some of said tubes, into said muffle, and superimposed of said conveyor so that one end is positioned in direct communication with the gaseous medium in the muffle; and means to seal said tubes at said casing and said muffle to inhibit gaseous medium communication between said muffle and externally of said casing.

4,060,378

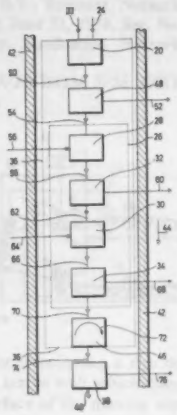
METHOD OF FIRING AND FURNACE THEREFOR

Károly Perédi, Budapest, Hungary, assignor to Energiagazdalkodasi Intezet, Budapest, Hungary

Division of Ser. No. 605,319, Aug. 18, 1975, abandoned. This application June 14, 1976, Ser. No. 695,567
Claims priority, application Hungary, Dec. 14, 1974, EE2292
Int. Cl.² F23M *3/04;* F27B *1/10*
U.S. Cl. 432—96 **4 Claims**

1. A furnace comprising a flame channel extending therethrough, a gasifier at the inlet end of the flame channel, means for supplying fuel to said gasifier, means for supplying primary combustion air to said gasifier in a deficient amount so that a combustible hot gas is formed in a first stage combustion for flow through said flame channel, heat withdrawal means in the path of flow of said combustible gas, means for introducing secondary combustion air into said combustible hot gas downstream of said heat withdrawal means in a deficient amount for complete combustion of the gas in a second combustion stage, means downstream of the second stage for supplying tertiary air to said gas for complete combustion in a third combustion

stage, said flame channel being at least partly confined by ceramic walls, and an uncooled mixing chamber downstream



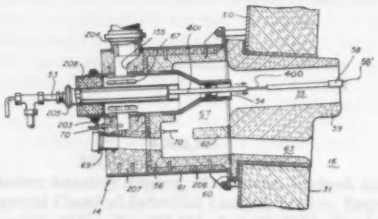
of the combustion stages for receiving the combustion gas from said flame channel.

4,060,379

ENERGY CONSERVING PROCESS FURNACE SYSTEM AND COMPONENTS THEREOF

Paul G. LaHaye; John W. Bjerklie, both of Cape Elizabeth, and Gerald G. Gallant, Jr., Gorham, all of Maine, assignors to Hague International, S. Portland, Maine

Continuation-in-part of Ser. No. 547,381, Feb. 6, 1975. This application Jan. 27, 1976, Ser. No. 652,877
Int. Cl.[2] F27D *17/00*
U.S. Cl. 432—179 9 Claims



1. A recirculating burner for use in a furnace area comprising,

means defining an eductor channel opening to a burner side at one end and having a second end,

second means defining a second channel having an end interconnected with said second end of said eductor channel, said second channel being positioned to receive heated gas for recirculation,

said eductor channel having mounted therein a fuel nozzle tip and an eductor combustion air outlet nozzle for passing combustion air toward said fuel nozzle tip with said fuel nozzle tip facing outwardly at said one end,

third means for supplying combustion air to said combustion air outlet nozzle,

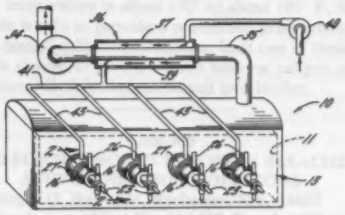
fuel means for providing fuel at said fuel nozzle tip which fuel is exposed to combustion air from said eductor, and mixed with recirculated gas from said recirculating channel to form a flame front when ignited which flame front is positioned out of said eductor channel one end.

4,060,380

FURNACE HAVING BURNERS SUPPLIED WITH HEATED AIR

James S. Bolt, Rockford, Ill., assignor to Alco Standard Corporation, Valley Forge, Pa.

Filed June 14, 1976, Ser. No. 696,062
Int. Cl.[2] F27D *17/00*
U.S. Cl. 432—179 6 Claims



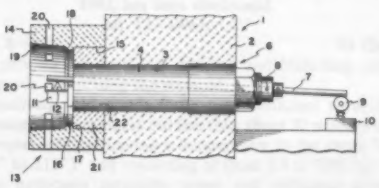
1. A furnace comprising a walled enclosure defining a heating chamber, a burner supported by said enclosure for heating said chamber, said burner comprising a tubular metallic body adapted to receive fuel and combustion air for producing a hot gaseous stream, a tubular burner block made of non-metallic refractory material and secured to one end of said body for receiving said stream, said burner block having a constricted nozzle for increasing the velocity of said stream and having a tubular extension located downstream of said nozzle, said extension having an interior larger than the downstream end of said nozzle, means defining an annular compartment around said extension, a series of passages formed through and spaced angularly around said extension and establishing communication between said compartment and the interior of said extension, means defining an air chamber located to be heated by heat produced in said heating chamber, and means for establishing communication between said air chamber and said compartment whereby heated air in said air chamber flows into said compartment and through said passages to mix with the hot gaseous stream passing within said extension.

4,060,381

SHIELD FOR PYROMETRIC CONES USED IN CERAMIC FIRING KILNS

John C. Watson; John D. Watson, and Gerald K. Watson, all of Caseville, Mich., assignors to Evenheat Kiln, Inc., Caseville, Mich.

Filed May 3, 1976, Ser. No. 682,193
Int. Cl.[2] F27D *1/10*
U.S. Cl. 432—247 9 Claims



1. In a ceramic kiln into which extends one end of a hollow tube through which a swingable control member extends and projects beyond said tube into said kiln, said control member normally being maintained in a preselected position by means of a heat deformable cone member, , and means for supporting said cone member at a position adjacent but spaced axially from said one end of said tube, the improvement comprising a shield construction having a heat resistant shield member supported on said tube at said one end thereof and being of such length as to extend axially of said tube into said kiln a distance to overhang the supporting means for said cone member, said shield member having at least one opening therein in communication with said kiln.

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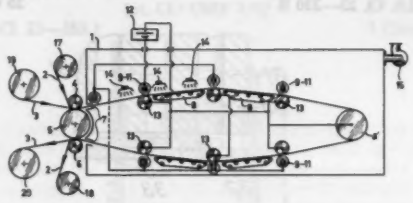
4,060,382

METHOD AND DEVICE FOR DYE TRANSFER PRINTING

Jacobus Gerardus Vertegaal, Boxmeer, Netherlands, assignor to Stork Brabant B.V., Boxmeer, Netherlands

Filed June 23, 1976, Ser. No. 699,208
Claims priority, application Netherlands, July 2, 1975, 7507902
Int. Cl.[2] D06P *5/20*; B41M *5/26*; H01T *19/00*; H02N *1/00*
U.S. Cl. 8—2.5 A 3 Claims



1. A method for transferring a dye design from a moving support strip to a textile web which comprises:

pressing the surface of the moving support strip which has the dye design thereon in contact with the textile web;

passing said contacting support strip and said textile web in a common path through an enclosed housing;

evacuatign said housing to create a subatmospheric pressure therein;

heating the surface of said moving support strip opposite to the surface in contact with said textile web while in said housing to aid said dye design transfer;

passing the surface of said textile web opposite to the surface in contact with said support strip over a charged supporting surface while in said housing, and at the same time directing a very narrow and converging beam of electrostatic charge opposite in character to the charge on said supporting surface against the surface of the moving support strip opposite to said textile web in order to produce an electrical adherance between the moving support strip and textile web and thereby aid in dye design transfer.

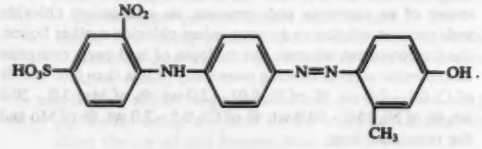
4,060,383

MONOAZO DYESTUFFS

Denis Robert Annesley Ridyard, Manchester, England, assignor to Imperial Chemical Industries Limited, London, England

Continuation of Ser. No. 498,853, Aug. 19, 1974, abandoned, which is a division of Ser. No. 252,576, May 12, 1972, abandoned. This application Nov. 19, 1975, Ser. No. 633,558
Claims priority, application United Kingdom, May 17, 1971, 15272/71
Int. Cl.[2] D06P *1/39, 3/34*
U.S. Cl. 8—41 B 1 Claim

1. A process for the coloration of synthetic polyamide textile materials which comprises applying thereto an aqueous solution of a monoazo dyestuff consisting of a dye having the formula



4,060,384

MANUFACTURE OF LEATHER

Marcel Siegler, North Bergen, N.J., assignor to Seton Company, Newark, N.J.

Filed Sept. 9, 1976, Ser. No. 721,706
Int. Cl.[2] C14C *3/06, 3/28*
U.S. Cl. 8—94.27 14 Claims

1. In the manufacture of grain and split leather from a hide, the improvement according to which the hide is subjected to a pre-tanning with an essentially chromium-free tan until its shrinkage temperature is about 170° to about 185° F, the pre-tanned hide is split to provide a pre-tanned grain intermediate and a pre-tanned split intermediate, at least one of these intermediates is shaved to give it a more uniform caliper, and the shaved intermediate is chrome-tanned into leather.

4,060,385

METHOD FOR HYDROGEN PEROXIDE BLEACHING IN ACID OR NEUTRAL SOLUTIONS

Jerome Katz, P.O. Box 1544, Rochester, N.Y. 14603

Continuation-in-part of Ser. No. 312,637, Dec. 6, 1972, Pat. No. 3,918,898. This application Sept. 2, 1975, Ser. No. 609,734
Int. Cl.[2] D06L *3/02*
U.S. Cl. 8—111 32 Claims

1. A process for scouring, desizing and bleaching cotton griege goods comprising the steps of:

a. immersing said goods for a time sufficient to achieve commercial brightness but less than about 30 minutes in an aqueous solution having a temperature in the range from 112° to 212° F and consisting of from 3 to 70% by volume hydrogen peroxide, water and sufficient hydroxide to adjust said solution to a pH in the range 2 to 7, said solution being substantially free of heavy metal ions and maintained out of contact with all metals while said goods are immersed therein;

b. cycling a portion of said solution through a filtration means to remove solid impurities therefrom while maintaining the volume, composition and pH of said solution in contact with said goods substantially the same;

c. rinsing said goods with water to wash said aqueous solution therefrom; and

d. drying said goods.

4,060,386

ALKALINE HYDROGEN PEROXIDE BLEACHING METHOD

Jerome Katz, P.O. Box 1544, Rochester, N.Y. 14603

Continuation-in-part of Ser. No. 312,637, Dec. 6, 1972, Pat. No. 3,918,898. This application Sept. 2, 1975, Ser. No. 609,735
The portion of the term of this patent subsequent to Nov. 11, 1992, has been disclaimed.
Int. Cl.[2] D06L *3/02*
U.S. Cl. 8—111 33 Claims

1. A process for scouring, desizing and bleaching cotton greige goods comprising the steps of:

a. immersing said goods for a time sufficient to achieve commercial brightness but less than about 30 minutes in an aqueous solution having a temperature in the range from 100° to 212° F and consisting of from 0.3 to 70% by volume hydrogen peroxide, water and sufficient alkaline additive to adjust said solution to a pH in the alkaline range, said solution being substantially free of heavy metal ions and maintained out of contact with all metals while said goods out of contact with all metals while said goods are immersed therein;

b. cycling a portion of said solution through a filtration means to remove solid impurities therefrom while maintaining the volume, composition and pH of said solution in contact with said goods substantially the same;

c. rinsing said goods with water to wash said aqueous solution therefrom; and

d. drying said goods.

4,060,387

AROMATIC CARBOXYLIC ACID ESTERS AND AMIDES AS FIXING AGENTS

Hans-Peter Baumann, Allschwil, and Hans-Georg Karmann, Binningen, both of Switzerland, assignors to Sandoz Ltd., Basel, Switzerland

Division of Ser. No. 404,696, Oct. 9, 1973, Pat. No. 3,950,419.
This application Nov. 10, 1975, Ser. No. 630,089
Claims priority, application Switzerland, Oct. 13, 1972, 15035/72
Int. Cl.² D06P 5/04
U.S. Cl. 8—169 15 Claims

1. In a process wherein a fabric consisting of or containing fibers of polyester, cellulose 2½ acetate, cellulose triacetate or polyvinyl chloride is dyed or printed, the improvement which comprises applying to the fabric before, during or after the dyeing or printing thereof a compound of the formula

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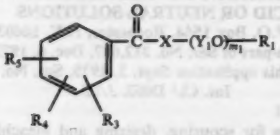


wherein

X is —O— or —NR—,

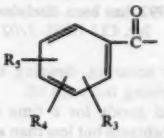
R is hydrogen, phenyl, phenylalkyl (C_7-C_{22}), phenyl or phenylalkyl (C_7-C_{22}) substituted by —OH, alkyl or halogen and having up to 22 carbon atoms in the aggregate thereof, alkyl (C_1-C_{22}), cycloalkyl (C_5-C_7), alkyl (C_1-C_{15}) cycloalkyl (C_5-C_7), cycloalkyl (C_5-C_7) alkyl (C_1-C_{15}), alkyl (C_1-C_{15}) cycloalkyl (C_5-C_7) alkyl (C_1-C_{15}) or a group $—(Y_2—O)_{m_2}—R_2$

Y_1 and Y_2 are, independently, ethylene, 1,2-propylene, 1,3-propylene, 1,2-butylene or phenylethylene, with the proviso that

a. only the group Y_1 or Y_2 which is bound to —X—, can be 1,3-propylene, and

b. each (Y_1-O) or (Y_2-O) chain contains no more than 2 phenylethylene groups,

R_1 and R_2 are, independently, hydrogen, phenyl, phenylalkyl (C_7-C_{22}), phenyl or phenylalkyl substituted on the phenyl nucleus by —OH, alkyl or halogen and having up to 22 carbon atoms in the aggregate thereof, alkyl (C_1-C_{22}), cycloalkyl (C_5-C_7), alkyl (C_1-C_{15}) cycloalkyl (C_5-C_7), cycloalkyl (C_5-C_7) alkyl (C_1-C_{15}), alkyl (C_1-C_{15}) cycloalkyl (C_5-C_7) alkyl (C_1-C_{15}), or a group



R_3 is hydrogen, halogen, alkyl (C_1-C_{22}), cycloalkyl (C_5-C_7), cycloalkyl (C_5-C_7) alkyl (C_1-C_{15}), alkyl (C_1-C_{15}) cycloalkyl (C_5-C_7), alkyl (C_1-C_{15}) cycloalkyl (C_5-C_7) alkyl (C_1-C_{15}), —CN, $—COOR_6$, $—SO_2R_6$, $—OR_6$, $—NHR_6$ or $—N(R_6)_2$, $—CO_2M$, $—SO_3M$ or a group $—CO—X—(Y_1-O)_{m_1}—R_1$,

R_4 is hydrogen, $—CO_2M$, $—OR_6$ or a group $—CO—X—(Y_1-O)_{m_1}—R_1$,

R_5 is hydrogen, $—CO_2M$ or a group $—CO—X—(Y_1O)_{m_1}—R_1$,

M is a charge equivalent of a cation, m_1 and m_2 are integers 1 to 100, the sum of all integers m_1 and m_2 being 1 to 100,

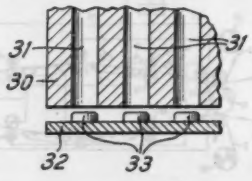
and R_6 is hydrogen or a group R.

4,060,388

SPECIMEN HOLDING DEVICE AND METHOD OF USING SAME

Wolfgang Rapp, Edingen; Karl-Heinz Haas, Wetzlar, and Heribert Luessem, Braunfels, all of Germany, assignors to Ernst Leitz GmbH Wetzlar, Wetzlar, Germany

Filed Apr. 6, 1976, Ser. No. 674,122
Claims priority, application Germany, Apr. 9, 1975, 7511053[U]
Int. Cl.² G01L 3/00; G01N 21/00, 31/02, 33/16
U.S. Cl. 23—230 R 25 Claims



18. A method for analyzing a fluid substance comprising the steps of placing in each of the elongated recesses of a device comprising:

a. a generally horizontally axially elongated, generally solid block of a transparent material, said block having longitudinal side surfaces, at least one of said surfaces enabling viewing through the block;

b. plural means for holding both the reagent and the fluid substance to be analyzed, with said fluid substance overlying the upper surface of the reagent before reaction therewith, said holding means including a plurality of elongated recesses extending downwardly from the top surface of the block, said recesses being positioned to permit separate lateral viewing, transverse to said at least one side surface, of each recess and of the reaction taking place therein between the reagent and the fluid substance in a region contiguous to the surface of the reagent, and

c. means for closing off the bottom ends of said recesses; a reagent which is reactive with said substance to produce a detectable indication function, adding said fluid substance to each recess so that the fluid substance overlies the upper surface of the reagent, whereby a detectable indication function is produced in said recesses, and observing said indication function by lateral viewing through each of said recesses.

4,060,389

APPARATUS FOR USE IN THE AMMONIA SODA PROCESS OR THE AMMONIUM CHLORIDE SODA PROCESS

Yoshiki Nishimura; Kazutaka Sakiyama; Tadao Adachi, and Kenji Harada, all of Shin-nanyo, Japan, assignors to Toyo Soda Manufacturing Co., Ltd. and Nihon Kinzoku Kogyo Kabushiki Kaisha, Tokyo, both of, Japan

Filed Jan. 7, 1976, Ser. No. 647,091
Claims priority, application Japan, Jan. 10, 1975, 50-4866; Jan. 10, 1975, 50-4867
Int. Cl.² B01J 1/20
U.S. Cl. 23—252 A 5 Claims

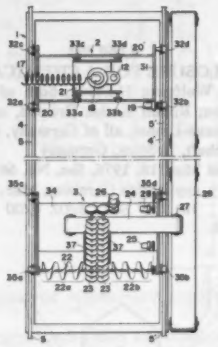
1. In an apparatus having parts intended for contact with an ammoniacal brine, a mother liquor formed in the carbonation tower of an ammonia soda process, an ammonium chloride soda process solution or an ammonium chloride mother liquor, the improvement wherein the surfaces of said parts comprise an austenitic steel consisting essentially of less than 0.05 wt. % of C; 0.1 – 2.0 wt. % of Si; 0.01 – 2.0 wt. % of Mn; 3.0 – 20.0 wt. % of Ni; 15.0 – 30.0 wt. % of Cr; 0.5 – 7.0 wt. % of Mo and the remainder iron.

4,060,390

APPARATUS FOR PRODUCING COMPOSTS

Kazufusa Shimizu, Setugaya; Shigeo Katsuori, Minosato, Tadaaki Nishikawa, Hino; Keisaku Senoo, Onishj; Kenji Sakamaki, Funabashi; Makio Fujita, Gunma; Teruo Tano, Ota; Hiroshi Takano, Shibuya, and Hideo Komori, Yokohama, all of Japan, assignors to Niigata Engineering Co., Ltd. and Seibu Chemical Industry Co., Ltd., both of Tokyo, Japan

Filed Aug. 9, 1976, Ser. No. 713,042
Claims priority, application Japan, Aug. 13, 1975, 50-98239
Int. Cl.[2] C05F *9/02*
U.S. Cl. 23—259.1 7 Claims



1. An apparatus for producing compost from a base compost mixture of previously fermented compost, and a slurry-like organic waste mixture added to said base compost, said apparatus comprising:

a fermentation vessel containing said base compost therein, said vessel having a base plate, vertical side walls and end walls extending upward from said base plate, and an open top;

feeding and stirring means for feeding said slurry-like organic waste within said base compost in said fermentation vessel and for simultaneously stirring said base compost and said slurry-like organic waste, said feeding and stirring means comprised of:

at least one rotatable stirring shaft member extending downwardly into said vessel, said shaft member having a passage therethrough which said slurry-like organic wastes are fed within said base compost, and

spiral member means fixed around the outside of said rotatable shaft for mixing said base compost and said slurry-like organic waste;

air supply means at the base of said fermentation vessel for supplying air into said fermentation vessel, whereby said mixture of base compost and said slurry-like organic wastes is aerobically fermented; and

gathering and carrying means at the top of said fermentation vessel above said mixture of base compost and organic waste for gathering an upper portion of predetermined thickness of said mixture, and carrying said gathered mixture out of and away from said fermentation vessel, said gathering and carrying means comprised of:

first conveying means mounted across the top of said fermentation vessel having a length substantially the same as the width of the fermentation vessel for gathering the upper portion of said mixture, and

second conveying means adjacent said first conveying means for carrying said mixture away from said fermentation vessel;

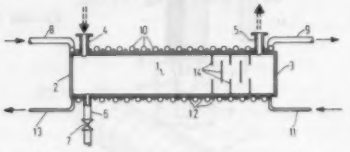
said feeding and stirring means and said gathering and carrying means being movable in the longitudinal direction along the top of said fermentation vessel.

4,060,391

APPARATUS FOR PRECIPITATING AND SEPARATING A MATERIAL IN A SOLID FORM FROM A GASEOUS MIXTURE

Hubertus Johannes Gerardus van Heel, Vriezenveen; Victor Leonard Bruins, and Joost Smid, both of Alkmaar, all of Netherlands, assignors to Ultra-Centrifuge Nederland N.V., The Hague, Netherlands

Filed Dec. 15, 1976, Ser. No. 750,628
Claims priority, application Netherlands, Dec. 19, 1975, 7514821
Int. Cl.[2] B01D *7/00, 5/00*
U.S. Cl. 23—264 3 Claims



1. Apparatus for precipitating and separating a material in solid form from a gaseous mixture comprising: an elongated vessel having a gas inlet connection at one end and a gas outlet connection at the other end; at least one cooling coil for conveying a cooling fluid, said cooling coil extending along at least a portion of the length of the vessel and being attached to a wall of the vessel; at least one heating coil for conveying a heating fluid said heating coil extending along at least a portion of the length of the vessel and being attached to a wall thereof, said coils being wrapped around the exterior of the vessel, with the convolutions of the cooling coil alternating with the convolutions of the heating coil and arranged to convey their fluids in counterflow relation, each of said coils including a controllable bypass by means of which the fluid being conveyed may be bypassed around a portion of the respective coil, said portion being less than the entire length of the respective coil, and a connecting pipe line provided with a flow-regulating element and connecting the two coils at a location intermediate their ends a fluid supply line connected to one end of each coil and a fluid discharge line connected to the other end of each coil, the controllable bypass for each coil including a valved bypass line connected between the respective supply and discharge lines and valved branch lines connecting spaced-apart locations along the length of the bypass line with spaced-apart locatons along the length of the respective coil.

4,060,392

DEVICE FOR THE SUPPORT OF A CRYSTALLINE ROD

Heinz Herzer, and Helmut Zauhar, both of Burghausen, Germany, assignors to Wacker-Chemitronic Gesellshaft fur Elektronik Grundstoffe mbH, Burghausen, Germany

Filed May 19, 1976, Ser. No. 687,711
Claims priority, application Germany, July 1, 1975, 2529366
Int. Cl.[2] B01J *17/10*
U.S. Cl. 23—273 SP 5 Claims

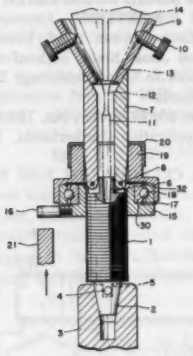
1. A device for supporting a crystalline rod and a seed crystal during crucible-free zone melting, said device being coupled to the rotatable shaft of a zone-drawing apparatus, comprising:

an externally threaded screw bolt mounted for rotation with the shaft, the top end of the screw bolt having an axially extending bore formed therein for receiving a seed crystal;

at least two vertically pivotable swivel arms, the lower ends of which are pivotably mounted adjacent to the bore and the outer ends of which are movable radially outwardly and inwardly relative to the axis of said bore to define respectively an open and closed position of said arms;

a ring coaxially surrounding the bolt and said inner ends of said arms and in sliding contact with said swivel arms and which is non-rotatably vertically movable so as to effect

movement of said swivel arms between said open and closed positions; and



means for non-rotatably vertically moving said ring so as to non-rotatably adjust the position of said swivel arms with respect to said bolt during the zone-melting operation.

4,060,393

APPARATUS FOR TREATING RAW MATERIAL WITH A TREATING GAS

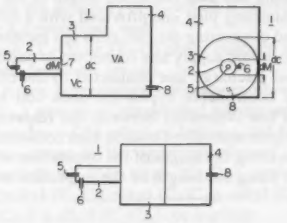
Shozo Ito, Ichikawa, Japan, assignor to Mifuji Iron Works Co., Ltd., Japan

Continuation-in-part of Ser. No. 823,746, May 12, 1969, abandoned. This application Feb. 3, 1975, Ser. No. 546,737

Claims priority, application Japan, May 15, 1968, 43-3217; June 20, 1968, 43-42258

Int. Cl.² B01J *1/00*

U.S. Cl. 23—277 R **9 Claims**



1. In an apparatus for treating raw material with a treating gas comprising a mixing chamber wherein a fuel is mixed with oxygen or air to form a mixture gas, a combustion chamber connected to said mixing chamber and having an inner space large enough in volume for the complete combustion of the mixture gas to generate a combustion gas, and a treating chamber wherein a raw material is converted into a desired product by the action of a treating gas; an improvement comprising a conditioning chamber connected between said combustion chamber and treating chamber and separated from said treating chamber; said combustion chamber having a cylindrical inner space with the entire cylindrical exit end thereof directly opening into and connected, without any intervening restrictive structure, to the entrance end of the interior of said conditioning chamber; said conditioning chamber having at least one of its cross-sectional dimensions larger than that of said combustion chamber so that the inner space of said conditioning chamber has a volume of one and one-half to six times larger than that of said cylindrical space of said combustion chamber and having means defining at least one gas inlet in said conditioning chamber for admitting at least one additional gas to be mixed with the combustion gas in said conditioning chamber to prepare the treating gas, said gas inlet being spaced from and generally facing said combustion chamber exit end so that the combustion gas and the additional gas flow in opposite directions into said conditioning chamber to effect uniform intermixing thereof to form the treating gas and having a treating gas outlet for discharging the treating gas from said conditioning chamber; and said treating chamber having one inlet connected to said treating gas outlet for receiving the treating gas and having spaced therefrom another inlet for receiving raw material which is to be treated with the treating gas.

4,060,394

BOTTOM CLOSURE FOR A CHEMICAL REACTOR

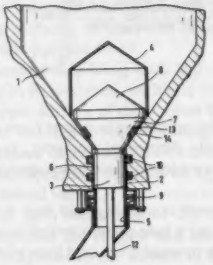
Herbert Grebe; Wolfgang Hartwig, both of Bremen; Johann Köhler, Barrien; Rudolf Rothe, Bremen, and Karl-Friedrich Schröder, Bremen-Lesum, all of Germany, assignors to HAG Aktiengesellschaft, Bremen, Germany

Filed Mar. 18, 1976, Ser. No. 667,949

Claims priority, application Germany, Mar. 21, 1975, 2512591

Int. Cl.² B01J *8/02, 4/00*

U.S. Cl. 23—284 **6 Claims**



1. In a reaction vessel for holding solids and having a lower section including a conical part and a cylindrical outlet extending downwardly from said conical part for discharge of solids for said reaction vessel, and a closure member for closing off said outlet, said closure member having a cylindrical portion and a conical portion, the conical portion seating on said lower section conical part and said cylindrical portion locating in said cylindrical outlet when said closure member is in a closure position, there further being first seal means associated with said closure member and said lower section of the reaction vessel for effecting a seal of said outlet when said closure member is in closure position, said closure member being movable upwardly to an open position in said lower conical section for opening said outlet, the upward movement of said closure member being effective to destroy any bridge of solids as may exist in said lower section adjacent said outlet, the improvement which comprises

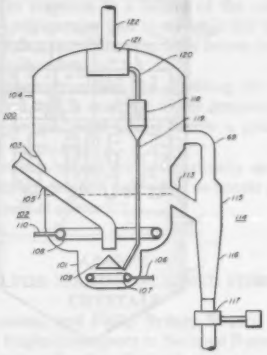
a cap member loosely received in said lower section conical part in covering position over said closure member and resting on said lower section conical part when said closure member is in a closure position, said closure member during upward movement thereof engaging said cap member for lifting said cap member upwardly in said lower section conical part, and means operable to protect said first seal means from contact with solids when said closure member is moved to an open position, there being sufficient free space provided between said closure member and cap member such that said closure member during upward movement thereof does not engage with said cap member to lift same until said means for protecting said first seal means have become operable.

4,060,395

FLUIDIZED CRACKING CATALYST REGENERATION APPARATUS

Leonce F. Castagnos, Jr., Nederland, and Roy E. Pratt, Groves, both of Tex., assignors to Texaco Inc., New York, N.Y.

Filed May 7, 1976, Ser. No. 684,438
Int. Cl.[2] B01J *8/24;* B01D *15/06*
U.S. Cl. 23—288 B 9 Claims



1. Fluidized catalytic regeneration apparatus, which comprises:

a. a vertical regenerator vessel **100** comprising a cylindrical lower regenerator section **101** having a closed bottom and open top, a cylindrical upper regenerator section **102** having an open top and an axially centered opening in the bottom for communication with the open top of lower regenerator section **101**, a frusto-conic transition section **103** having an open top and an open bottom for communication with the open top of upper regenerator section **102**, and a cylindrical dilute phase regenerator section **104** having a closed top and an open bottom for communication with the open top of transition section **103**;

b. spent catalyst conduit means **105** having a discharge end for transferring coke-contaminated spent catalyst from a reaction zone substantially vertically downward into about the axial center of lower regenerator section **101**;

c. spent catalyst distribution means **109** for distributing spent catalyst from the discharge of said spent catalyst conduit means **105** radially into lower regenerator section **101**;

d. primary regeneration gas distribution means **107** for distributing an oxygen containing primary regeneration gas radially into the bottom portion of lower regenerator section **101** under turbulent conditions such that spent catalyst and primary regeneration gas are intimately mixed at catalyst regeneration conditions;

e. secondary regeneration gas distribution means **110** for radially distributing an oxygen containing regeneration gas into the bottom of upper regenerator section **102** such that an intimate mixture of spent catalyst and primary regeneration gas flowing upward into upper regenerator section **102** from lower regenerator section **101** forms a fluidized dense phase bed of catalyst at regeneration conditions;

f. a regenerated catalyst duct **113** in communication with the interior of upper regenerator section **102** for withdrawing regenerated catalyst from the upper portion of said fluidized dense phase catalyst bed;

g. a regenerated catalyst standpipe **114** located exterior to reactor vessel **100** and in communication with the discharge or regenerated catalyst duct **113**;

h. a deaeration gas line **69** communicating from the top of regenerated catalyst standpipe **114** to dilute phase regenerator section **104**

i. catalyst gas separation means **118** for separating catalyst and spent regeneration gas from a dilute phase of catalyst suspended in regeneration gas within said dilute phase regenerator section **104**;

j. vent means **122** in communication with said catalyst-gas separation means **118** for removing separated spent regeneration gas from said regenerator vesel **100**; and

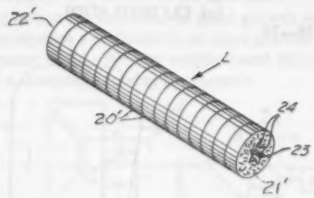
k. a conduit means **119** for transferring separated catalyst from catalyst-gas separation means **118** to lower regenerator section **101**.

4,060,396

WAFERED FUEL OF COMPRESSED WOOD PRODUCTS

James V. Burton, P.O. Box 749, Laramie, Wyo. 82070

Filed Oct. 28, 1975, Ser. No. 626,491
Int. Cl.[2] C10L *5/36, 11/00*
U.S. Cl. 44—14 3 Claims



1. A fuel in a cylindrical form of selected length comprising:

a plurality of relatively thin wafers arranged as an interlocking array of disc-shaped wafers including a major portion of wood particles without binders, with each wafer being a discrete member having one concave end and one convex end arranged to nest with a neighboring wafer,

each said wafer having a pointed star shaped central passage; and

the particles of each wafer being compressed together so as to tightly adhere to each other with the wafers only lightly adhered to an adjacent wafer so as to permit easy breaking of the fuel into discrete wafers.

4,060,397

TWO STAGE PARTIAL COMBUSTION PROCESS FOR SOLID CARBONACEOUS FUELS

Pieter Buiter, The Hague; Maarten J. van der Burgt, Akersloot, and Henricus J. A. Van Helden, Haariem Resp, all of Netherlands, assignors to Shell Internationale Research Maatschappij B.V., Netherlands

Continuation-in-part of Ser. No. 545,248, Jan. 29, 1975, abandoned. This application Nov. 26, 1976, Ser. No. 745,244
Claims priority, application United Kingdom, Feb. 21, 1974, 7903/74
Int. Cl.[2] C10J *3/00*
U.S. Cl. 48—197 R 1 Claim

1. A process for the production of a hydrogen and carbon monoxide-containing gas by partial combustion of a non-slurried solid carbonaceous fuel with an oxidant gas which comprises the steps of:

a. preheating the oxidant gas, being air or oxygen diluted with steam, carbon dioxide, nitrogen, oxygen, or mixtures thereof, to a temperature of from 200° to 1300° C;

b. mixing the preheated oxidant gas with the unslurried solid carbonaceous fuel having a partial size such that 70% is smaller than 200 mesh in proportions such that the atomic ratio of oxygen to total carbon in the fuel is from about 0.9 to about 1.4;

c. injecting the mixture into a first reaction zone at a linear velocity of from 10 to 200 m/sec;

d. passing the mixture through the first reaction zone, maintained at a temperature of from 1200° to 1700° C and a pressure of from 1 to 200 kg/cm², absolute, with a residence time of from 0.02 to 20 seconds to convert from

about 70 to about 90% of the fuel to a partial combustion product made up principally of hydrogen and carbon monoxide;

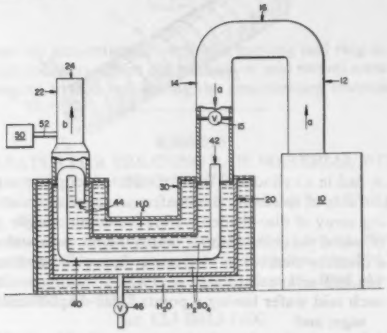
e. passing the combustion product from the first zone through a second reaction zone, maintained at an average temperature at least 100° C lower than that of the first zone and at a pressure up to 200 kg/cm², absolute, with a residence time of from 0.5 to 40 seconds wherein the remaining solid carbonaceous fuel is substantially completely converted to a partial combustion reaction product made up principally of hydrogen and carbon monoxide without formation of soot.

4,060,398

ABSORPTION PROCESS

Joseph Francois Houle, Oxford, Mass., assignor to Leah Mary Louise Houle, Oxford, Mass., a part interest

Filed Aug. 18, 1976, Ser. No. 715,285
Int. Cl.² B01D *47/00*
U.S. Cl. 55—73 **1 Claim**



1. An absorption process for purifying sulfur-containing exhaust gases emanating from a smoke-generating facility comprising the steps:

conducting the exhaust gases from the facility through a connecting gas inlet conduit to a water-cooled sulfuric acid bath communicating with the conduit,

directing the gases through the length of the bath via a bath conduit having an upstream entrance terminal disposed in the gas supply conduit and above the acid level in the bath and having a downstream discharge terminal reversed upon itself interiorly of the bath for the direct charge of the gases into the acid below the acid level in the bath, and

drawing by means of a vacuum pump the cleansed exhaust gases outwardly of the acid in the bath through a connecting gas outlet conduit for the venting of the cleansed gases therefrom to atmosphere.

4,060,399

SCRUBBER-COOLER TOWER

Thomas G. Gleason, 99 Colonial Parkway, Manhasset, N.Y. 11030

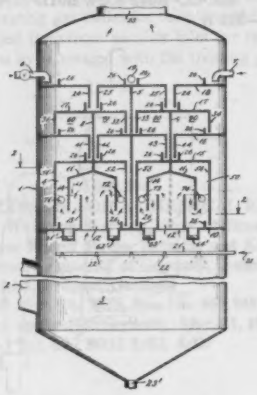
Filed Aug. 30, 1976, Ser. No. 718,600
Int. Cl.² B01D *47/02*
U.S. Cl. 55—244 **5 Claims**

1. A gas liquid contact apparatus adapted for efficient operation at high turn down comprising:

a vertical tower through which scrubbing liquid flows downwardly therethrough from at least one inlet thereto and gas flows upwardly therethrough from an inlet thereto to an outlet therefrom in counter flow gas-liquid contact.

at least one vertical baffle within said tower dividing the tower into compartments constituting separated gas-liquid contact flow paths through the tower; and

means for blocking gas flow through at least one compartment hereinafter termed the first compartment without impeding flow through another compartment, such means including a trap out tray at the bottom of the first compartment from which the liquid effluent is removed and a pair of drains in flow communication with said trap out



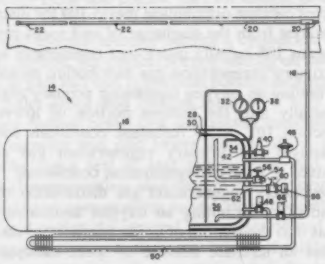
tray, said drains being disposed at different elevations and means to close off the lower elevation drain forcing thereby a rise in the level of liquid effluent on said trap out tray to the level of the higher elevation drain, the rise in liquid level creating a hydrostatic head barrier to gas flow into the first compartment.

4,060,400

REFRIGERATED SEMITRAILER TRUCK FOR LONG AND LOCAL DELIVERIES

David Roth Williams, Dallas, Tex., assignor to Henry L. Franke

Filed Aug. 22, 1975, Ser. No. 606,836
Int. Cl.² F25D *29/00*
U.S. Cl. 62—162 **6 Claims**



1. A vehicle for transporting a substantial load of frozen foods over a substantial distance and then off-loading portions of the load at each of a number of relatively closely spaced destinations which comprises:

a vehicle having an insulated load carrying compartment having at least one access door;

a mechanical refrigeration unit for refrigerating the compartment by means of a compression-expansion refrigeration cycle;

a cryogenic refrigeration unit for introducing liquified gas into the compartment when enabled by a manual switch of a control system and not disabled by the control system; and

a control system including

a. manual means for manually enabling operation of the control system,

b. high temperature means for automatically disabling the cryogenic refrigeration unit in response to the temperature of the air space in the compartment rising above a predetermined maximum value,

c. detection means for disabling the high temperature means to permit operation of the cryogenic refrigeration unit in response to a failure of the compression-expansion refrigerator unit to maintain the temperature of the air space in the chamber at or below the predetermined maximum value,

d. low temperature means for disabling the cryogenic refrigeration unit in response to the temperature of the air space compartment falling below a predetermined minimum value, and

e. door detection means for automatically disabling the cryogenic refrigeration unit when an access door to the compartment is opened.

4,060,401
METHOD FOR MAKING ALIGNED FIBROUS CRYSTALS

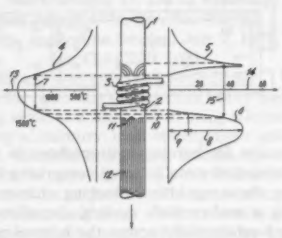
Alan Maries, London, and Philip Sydney Rogers, Rickmansworth, both of England, assignors to National Research Development Corporation, London, England

Filed Apr. 1, 1976, Ser. No. 672,599

Claims priority, application United Kingdom, Apr. 2, 1975, 13456/75

Int. Cl.² C03B *32/00, 31/00*

U.S. Cl. 65—33 **10 Claims**



1. A method of producing a rod which comprises essentially aligned individual fibrous crystals displaying a silicate chain structure, said method comprising the successive steps of:

1. providing a rod of siliceous material which when subjected to melting and drawing yields at its crystallization temperature a primary crystalline phase having a silicate chain structure, said siliceous material selected from the group consisting, by weight percent, of:
   a. CaO 30%, SiO_2 50%, ZnO 20%;
   b. CaO 35%, SiO_2 55%, ZnO 10%;
   c. CaO 26%, MgO 2%, Al_2O_3 13%, SiO_2 46%, ZnO 13%; and
   d. CaO 42.5%, SiO_2 50%, Na_2O 7.5%;
2. providing an orifice of a coil of metallic material;
3. drawing said rod through said metallic oil and heating said rod to form a melt which melt is both supported by and in contact with said heated metallic coil such that the melt crystallizes out in the form of aligned fibrous crystals;
4. drawing the rod and melt through said coil at a predetermined rate while concurrently:
   i. maintaining the melt in a molten condition as it is drawn through said heated coil by heating said coil, and
   ii. adjusting the rate of drawing to be within the speed of propagation of said crystalline phase through the melt, thereby

forming fiberous crystals substantially continuously and in a substantially parallel relationship to both each other and the longitudinal axis of the rod.

4,060,402
ISOXAZOLONE DERIVATIVES, THEIR PREPARATION AND THEIR USE AS PLANT GROWTH REGULATORS

Kazuo Tomita, Yokosuka; Tadashi Murakami, Tokyo; Yoshio Yamazaki, and Toyokuni Honma, both of Nozu, all of Japan, assignors to Sankyo Company Limited, Tokyo, Japan

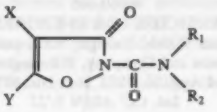
Division of Ser. No. 517,298, Oct. 23, 1974, which is a continuation-in-part of Ser. No. 498,617, Aug. 19, 1974, abandoned, which is a continuation of Ser. No. 308,942, Nov. 24, 1972, abandoned. This application Apr. 9, 1975, Ser. No. 566,238

Claims priority, application Japan, Oct. 19, 1972, 47-104720; Oct. 19, 1972, 47-104721

Int. Cl.² A01N *9/22*; C07D *261/10*

U.S. Cl. 71—76 **5 Claims**

1. A composition for herbicidal or plant growth retardation use which comprises a herbicidally or plant growth retarding effective amount of 0.1 - 99% by weight, based upon the composition, of a compound having the formula

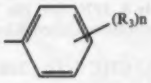


wherein

X is hydrogen atom, lower alkyl or halogen atom;

Y is hydrogen atoms, lower alkyl or phenyl; and

R_1 and R_2 may be the same or different and each represents lower alkyl, dialkoxyalkyl having from 1 to 3 carbon atoms in each of the alkyl and alkoxy portions, alkoxycarbonylalkyl having 1 to 4 carbon atoms in the alkoxy portion and 1 to 2 carbons in the alkyl portion, cycloalkyl having from 5 to 7 carbon atoms, alkeny having from 3 to 5 carbon atoms, alkynyl having from 3 to 4 carbon atoms, lower alkoxy, substituted phenyl having the formula



wherein R_3 is lower alkyl, halogen, lower alkoxy, alkoxycarbonyl having 1 to 4 carbon atoms in the alkoxy portion, nitro or trifluoromethyl, and n is an integer from 0 to 3 and R_3 may be the same or different, or substituted aralakyl having the formula

wherein m is 1 or 2 and R_3 and n are as defined above and an inert carrier.--

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4,060,403
METHOD OF CONTROLLING WEEDS WITH N-(3-METHYL-5-ISOTHIAZOLYL)-2-METHYLPENTANAMIDE

Joseph Deli, Rockford, Ill., and Henry C. Stevens, Akron, Ohio, assignors to PPG Industries, Inc., Pittsburgh, Pa.

Division of Ser. No. 574,792, May 5, 1975, Pat. No. 4,013,675. This application Aug. 23, 1976, Ser. No. 716,722

Int. Cl.² A01N *9/12*

U.S. Cl. 71—90 **10 Claims**

1. A method of controlling weeds which comprises contacting the environment of the weed with a herbicidal dosage of

the compound N-(3-methyl-5-isothiazolyl)-2-methylpentanamide.

4,060,404

SELECTIVE HERBICIDE FOR SUGARCANE

Arlyn Wayne Evans, Memphis, Tenn., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Continuation-in-part of Ser. No. 700,079, July 6, 1976, abandoned, which is a continuation of Ser. No. 607,896, Aug. 26, 1975, abandoned. This application Aug. 9, 1976, Ser. No. 712,194

Int. Cl.[2] A01N 9/22

U.S. Cl. 71—93 5 Claims

1. Method for preventing and controlling undesired vegetation in sugarcane crops without causing significant injury to said crop comprising applying to the locus of said crop an effective amount of 1-methyl-3-cyclohexyl-6-dimethylamino-s-triazine-2,4(1H,3H)-dione.

4,060,405

SELECTIVE HERBICIDE FOR EVERGREEN SEEDLINGS

Aaron Waddington Welch, Raleigh, N.C., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Aug. 26, 1975, Ser. No. 607,897

Int. Cl.[2] A01N 9/22

U.S. Cl. 71—93 8 Claims

1. Method for preventing and controlling undesired vegetation in the locus of evergreen seedlings without causing significant injury to said seedlings comprising applying to the locus of said seedlings an effective amount of 1-methyl-3-cyclohexyl-6-dimethylamino-s-triazine-2,4(1H, 3H)dione.

4,060,406

ARC STEELMAKING

Evan Thomas Richard Jones, Birmingham, England, assignor to Foseco International Limited, Birmingham, England

Filed July 8, 1976, Ser. No. 703,674

Claims priority, application United Kingdom, July 16, 1975, 29920/75

Int. Cl.[2] C21C 5/52; C22B 9/10

U.S. Cl. 75—12 12 Claims

1. A slag conditioner for use in electric arc steelmaking, which conditioner comprises by weight:

alumina—30 to 80%

aluminium—10 to 30%

fluorspar—5 to 40%

and up to 20% by weight of alkali metal carbonate.

4,060,407

METHODS AND APPARATUS FOR ADDING MISCHMETAL TO MOLTEN STEEL

Joseph R. Jackman, West Pittsburgh, Pa., assignor to Reactive Metals & Alloys Corporation, West Pittsburgh, Pa.

Division of Ser. No. 607,625, Aug. 25, 1975, Pat. No. 4,022,444. This application Nov. 22, 1976, Ser. No. 744,123

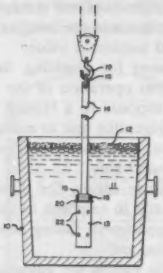
Int. Cl.[2] C21C 7/00; C22C 23/06

U.S. Cl. 75—58 7 Claims

1. The method of adding mischmetal to steel comprising the steps of:

a. forming a composite article consisting essentially of a metal canister filled with a mischmetal-magnesium alloy in which the magnesium is present in an amount sufficient to generate stirring in a molten steel bath to which it is added in the range 1% to 2.5% and the balance is mischmetal,

b. plunging the metal canister containing mischmetal magnesium alloy beneath the surface of a molten steel bath being treated, and



c. holding the metal canister beneath the surface of the steel bath until the canister and mischmetal-magnesium alloy is dissolved.

4,060,408

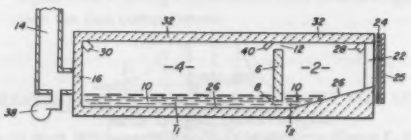
MELTING PROCESS

John E. Kuhn, Lower Burrell, Pa., assignor to Aluminum Company of America, Pittsburgh, Pa.

Filed Jan. 31, 1977, Ser. No. 763,829

Int. Cl.[2] C22B 21/00

U.S. Cl. 75—68 R 12 Claims



1. A process for burning hydrocarbons in vapors emitted from contaminated metallic scrap comprising the steps of:

charging the scrap into a charging chamber of a furnace having a molten bath moving therethrough, said bath located substantially across the bottom portions of said charging chamber and a directly fired heating chamber, said chambers separated by a wall, said chambers in communication below the surface of the molten bath through at least one lower passageway through said wall, and said chambers in communication above the surface of the molten bath through at least one upper passageway through said wall;

maintaining a negative pressure in the heating chamber with respect to the charging chamber, whereby hydrocarbon vapors emitted from the scrap charged into the charging chamber are drawn through the upper passageway through said wall and into the heating chamber by said pressure differential; and

completing the combustion of the hydrocarbons in the vapors in the heating chamber.

4,060,409

MECHANICALLY STIRRED FURNACE FOR PYROMETALLURGICAL OPERATIONS AND PROCESSES

Paul R. Ammann, Boxford; Peter B. Crimes, Sudbury, and Jonathan J. Kim, Chelmsford, all of Mass., assignors to Kennecott Copper Corporation, New York, N.Y.

Filed Feb. 23, 1976, Ser. No. 660,147

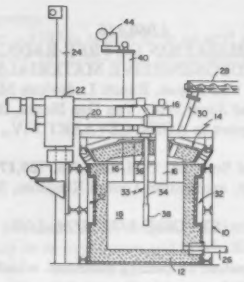
Int. Cl.[2] C22B 9/02; C21C 5/52; H05B 7/18

U.S. Cl. 75—93 R 12 Claims

1. A pyrometallurgical system for maintaining a material in a molten state, comprising

a vessel for the material, said vessel having an internal shape, in a horizontal cross section, which is dividable into a predetermined number of substantially equiaxed cells of substantially uniform size,

a plurality of mechanical stirrers projecting into said vessel



for stirring molten material therein, each stirrer being substantially centered in a cell,

drive means for rotating each stirrer with a predetermined sense of rotation, and

heating means for supplying heat to the contents of said vessel.

4,060,410

PROCESS FOR REMOVING HEAVY METALS FROM FLUID MEDIA

Marcel Laszlo, Utmarksvagen 17, 151 52 Sodertalje, Sweden

Filed July 6, 1976, Ser. No. 702,791

Claims priority, application Sweden, July 7, 1975, 75077438

Int. Cl.[2] C22B *5/00*

U.S. Cl. 75—109 **17 Claims**

1. A method for removing one or more heavy metals from a fluid containing same, said heavy metal being selected from the group consisting of mercury, lead, cobalt, silver, gold, copper, zinc, cadmium, bismuth, manganese, arsenic, tin and nickel, which comprises the steps of placing a metal sheet in said fluid so that a portion of the surface of said sheet contacts said fluid and another portion of said sheet surface contacts the ambient air, said metal sheet being made of a metal having a lower redox potential than said heavy metal; contacting said fluid and said sheet with a solution of a complex effective as an activator to cause said heavy metal to precipitate in the fluid; and then separating said precipitate from said fluid.

4,060,411

PRECIPITATION-HARDENABLE, NITRIDED ALUMINUM ALLOYS AND NITRIDED MOTHER ALLOYS THEREFOR

Mituhiro Goto, Tokyo; Isao Hashimoto, Ichikawa; Shugo Watanabe, Tokyo, and Koji Itabashi, Kitamoto, all of Japan, assignors to Mamiya Koki Kabushiki Kaisha, Otsuka, Japan

Filed Feb. 9, 1976, Ser. No. 656,601

Claims priority, application Japan, Feb. 26, 1975, 50-23529; Feb. 26, 1975, 50-23530

Int. Cl.[2] C22C *1/02, 1/03, 21/00*

U.S. Cl. 75—138 **8 Claims**

1. A process for producing a nitrided mother alloy to be used in preparing a final composition which is a precipitation-hardenable, nitrided aluminum alloy which nitrided aluminum alloy consists essentially of 3.2 to 8.0% of zinc, 1.2 to 4.5% of magnesium, 0.1 to 1.0% of copper, 0.1 to 0.5% of chromium, 0.01 to 1.2% of zirconium and/or titanium, 0.2 to 1.2% of nickel or cobalt, 0.02 to 1.0% of beryllium, 0.005 to 0.2% of boron, and the remainder aluminum, the process comprising the steps of alloying metals selected from the group consisting of (1) chromium, zirconium and/or titanium, nickel or cobalt, beryllium, boron and aluminum, and (2) chrominum, zirconium and/or titanium, nickel or cobalt, beryllium boron, aluminum and at least one selected from the group consisting of zinc, magnesium and copper, the amount of the metals other than aluminum being 2 to 10 times larger than that desired in the final composition, and blowing a nitriding gas selected from the group consisting of molecular nitrogen, decomposable nitrogenous gases and mixtures thereof into the molten alloy having a temperature of 800° C to 1200° C to produce the nitrided mother alloy.

4,060,412

METHOD FOR PREPARING A FIBER REINFORCED METAL MATRIX USING MICROSCOPIC FIBERS

Amarnath P. Divecha, Falls Church, Va., assignor to A Silag Inc., McMurray, Pa.

Filed Jan. 8, 1976, Ser. No. 647,442

Int. Cl.[2] B22F *3/00*

U.S. Cl. 75—203 **11 Claims**

1. A process of preparing a fiber-reinforced metal composite which includes dry mixing a metal powder with ceramic fibers to obtain a substantially uniform dispersion of fibers throughout a dry metal-fiber mixture, cold pressing the metal powder-fiber mixture so formed at a first predetermined pressure, heating the pressed metal powder-fiber mixture to a temperature sufficient to permit further densification of the metal powder-fiber mixture, hot pressing the mixture to product further densification thereof, and cooling the resultant composite.

4,060,413

METHOD OF FORMING A COMPOSITE STRUCTURE

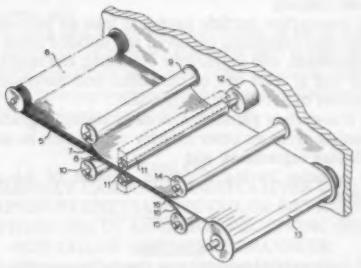
Peter J. Mazzei, Jordan, and Gerrit VanDrunen, Hamilton, both of Canada, assignors to Westinghouse Canada Limited, Hamilton, Canada

Filed June 11, 1976, Ser. No. 694,927

Claims priority, application Canada, Dec. 24, 1975, 242605

Int. Cl.[2] B22F *3/00*

U.S. Cl. 75—208 R **9 Claims**



1. A method of forming a composite article of specific shape formed from matrix material and reinforcing fibres comprising forming a flexible plastic tape including said matrix material in powdered form and a flexible plastic decomposable binder, arranging a plurality of continuous parallel fibres on the surface of said tape, embedding said fibres in said tape by heat and pressure or by applying a second layer of tape matrix material cutting from the resulting tape a plurality of laminae of suitable shape, arranging said laminae in a container in such a manner as to form said specific shape, subjecting said laminae to heat and outgassing to remove said decomposable binder and subjecting said laminae and container to heat and pressure to bond said matrix material and fibres into a substantially void free coherent composite article.

8. A method of forming a composite article formed from a matrix of superalloy and metallic fibres selected from the class of tungsten, molybdenum, silicon carbide and graphite fibres,

comprising forming a flexible tape consisting of powdered superalloy and a plastic organic material, arranging a plurality of continuous parallel fibres between two layers of said tape, bonding the tape and fibres into a substantially void free composite tape, substantially filling a metallic container with laminae cut from said composite tape, heating and outgassing said container to decompose and remove said organic material, flushing said heated container with hydrogen gas, filling any remaining space in said container with powdered superalloy, evacuating said container and subjecting said container to hot isostatic pressing sufficient to form a coherent composite article.

4,060,414

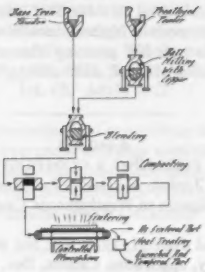
COPPER COATED IRON-CARBON EUTECTIC ALLOY POWDERS

Sydney M. Kaufman, Livonia, Mich., assignor to Ford Motor Company, Dearborn, Mich.

Division of Ser. No. 584,562, June 6, 1975, Pat. No. 4,011,077. This application May 14, 1976, Ser. No. 686,620

Int. Cl.[2] C22C *1/02*

U.S. Cl. 75—246 **3 Claims**



1. A sintered iron based alloy composition, comprising:

a matrix of iron-carbon particles sintered together in intimate contact,

each iron-carbon particle having at least an interior peripheral zone containing dissolved and diffused metal alloying ingredients, said ingredients consisting essentially of copper and at least one of chromium and manganese in an amount of 2–10% by weight, and

said iron-carbon particles also each having a gradient proceeding from an outer exterior region rich in said metal alloying ingredients, and

said particles having a carbon content of 0.4–.68% by weight.

4,060,415

ELECTROPHOTOGRAPHIC PROCESS

Petrus J. M. van Nunen, Reuver, and Willem van Barneveld, Grubbenvorst, both of Netherlands, assignors to Océ-van der Grinten, N.V., Venlo, Netherlands

Filed June 4, 1973, Ser. No. 366,845

Claims priority, application Netherlands, June 7, 1972, 7207688

Int. Cl.[2] G03G *5/08*

U.S. Cl. 96—1.8 **14 Claims**

1. An electrophotographic process which comprises charging electrostatically and thereafter exposing imagewise a photoconductive layer of less than 6 microns in thickness containing zinc oxide and a binder in a weight ratio ZnO:binder of between 9 and 14 to 1 and which layer is chargeable at most to a surface potential between 100 and 250 V, said layer being present on a flexible support having a specific resistance of less than 10^{13} ohm. cm, and developing the charge pattern resulting on said layer so as to render it visible by contacting it during not more than 3 seconds with one-component developing powder of a mass thereof the particles of which are of substantially the same composition and predominantly comprise resin and finely divided relatively conductive material, and which has a specific resistance below 10^7 ohm. cm, while maintaining a connection for charge conductance, at least in part through said mass, between said powder and said support.

4,060,416

STABILIZATION OF FREE-RADICAL PHOTOSENSITIVE MATERIALS

Freddy Ghisleen Van Royen, Ranst; Ludovicus Maria Mertens, Borgerhout, and Jozef Willy Van Den Houte, Berchem, all of Belgium, assignors to AGFA-GEVAERT N.V., Mortsel, Belgium

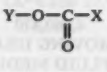
Filed Sept. 14, 1976, Ser. No. 723,179

Claims priority, application United Kingdom, Sept. 16, 1975, 38072/75

Int. Cl.[2] G03C *1/52, 5/24, 1/48*

U.S. Cl. 96—48 R **9 Claims**

1. A photosensitive recording material, which comprises a support bearing at least one layer containing at least one photosensitive organic polyhalogen compound producing free radicals upon exposure to ultraviolet and/or visible light, a dye precursor in said layer or in a layer adjacent thereto, which by the action of said free radicals forms a dye, and a thermally activatable stabilizing substance within the scope of the following general formula:



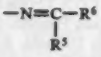
wherein:

X represents

1. an aryl group,
2. the group —OR^1 in which R^1 is an aryl group,
3. the group —CH=CH—R^2 in which R^2 is an aryl group, or
4. the group

in which R^3 stands for hydrogen, an alkyl group, a cycloalkyl group, an aryl group and in which R^4 stands for an alkyl group, a cycloalkyl group, or an aryl group, or R^3 and R^4 together represent the necessary atoms to close a saturated 5- or 6-membered nitrogen-containing heterocyclic ring, and

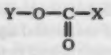
Y represents the group



in which R^5 represents hydrogen or an alkyl group, and R^6 represents (1) an aryl group or (2) an acyl group.

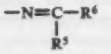
9. A recording process including image stabilization comprising the steps of:

1. image-wise exposing to ultraviolet radiation and/or visible light a photosensitive recording material, which comprises at least one supported or self-supporting layer containing at least one photosensitive organic polyhalogen compound producing free radicals upon exposure to ultraviolet radiation and/or visible light, a dye precursor in said layer or in a layer adjacent thereto, which by the action of said free radicals forms a dye in the said layer or in a layer adjacent thereto, and a thermally activatable stabilizing substance within the scope of the following general formula:



wherein:
X represents
1. an aryl group,
2. the group —OR^1 in which R^1 is an aryl group,
3. the group —CH=CH—R^2 in which R^2 is an aryl group, or
4. the group

in which R^3 stands for hydrogen, an alkyl group, a cycloalkyl group or an aryl group and in which R^4 stands for an alkyl group, a cycloalkyl group or an aryl group, or R^3 and R^4 together represent the necessary atoms to close a 5- or 6-membered saturated nitrogen-containing heterocyclic ring, and
Y represents the group



in which R^5 represents hydrogen or an alkyl group, and R^6 represents an aryl group, or an acyl group, and
2. heating the photo-exposed material to effect conversion of non-decomposed polyhalogen compound into a non-photosensitive condition by means of said thermally activatable substance.

4,060,417

DIFFUSION TRANSFER ELEMENTS COMPRISING COLOR-PROVIDING COMPOUNDS CAPABLE OF CLEAVAGE UPON REACTION WITH SILVER IONS AND SILVER ION BARRIER LAYERS

Ronald F. W. Cieciuch; Roberta R. Luhowy, both of Newton; Frank A. Meneghini, Arlington, and Howard G. Rogers, Weston, all of Mass., assignors to Polaroid Corporation, Cambridge, Mass.

Continuation-in-part of Ser. No. 465,694, April 30, 1974, abandoned, which is a continuation-in-part of Ser. No. 317,168, Dec. 21, 1972, abandoned, which is a division of Ser. No. 155,123, June 17, 1971, Pat. No. 3,719,489. This application May 5, 1975, Ser. No. 574,296

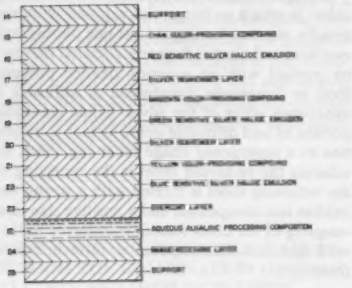
The portion of the term of this patent subsequent to Mar. 6, 1990, has been disclaimed.

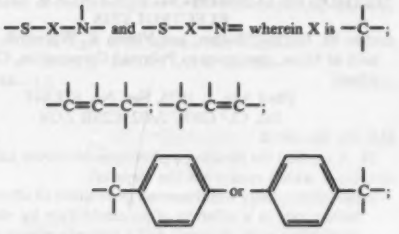
Int. Cl.[2] G03C *7/00, 1/40, 1/76, 5/54*

U.S. Cl. 96—3 **52 Claims**

20. A photographic process for forming multicolor images comprising the steps of

a. exposing a photosensitive element comprising a plurality of layers including a support, at least two selectively sensitized silver halide emulsion layers, each of said emulsion layers having associated therewith, a color-providing compound capable of undergoing cleavage in the presence of an imagewise distribution of silver ions and/or soluble silver complex to liberate a color-providing moiety in an imagewise distribution corresponding to said distribution of silver ions and/or said complex, one of said color-providing compound and said color-providing moiety being diffusible in aqueous alkaline solution and the other being substantially non-diffusible in aqueous alkaline solution, and a scavenger layer containing a scavenger for silver ion and/or soluble silver complex, said scavenger layer being positioned between said two selectively sensitized silver halide emulsion layers, each of said color-providing compounds being a compound containing a group selected from





b. applying an aqueous alkaline processing composition to said photosensitive element to provide an aqueous alkaline solution of a silver halide developing agent and a silver halide solvent therein, thereby developing said photosensitive element;
c. forming in undeveloped areas of each of said emulsions an imagewise distribution of silver ions and/or soluble silver complex; and
d. contacting said imagewise distribution of silver ions and/or soluble silver complex formed in each of said emulsion with the emulsion's associated color-providing compound thereby forming corresponding imagewise distributions of each of said color-providing moieties.

4,060,418

PHENOXY CARBONYL DERIVATIVES OF A PARAPHENYLENEDIAMINE COLOR DEVELOPER AND THEIR USE IN AN IMAGE-RECEIVING SHEET FOR COLOR DIFFUSION TRANSFER

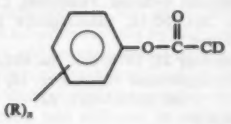
Burton H. Waxman, Endwell, and Michael C. Mourning, Vestal, both of N.Y., assignors to GAF Corporation, New York, N.Y.

Filed Feb. 13, 1976, Ser. No. 657,855

Int. Cl.[2] G03C *7/00, 5/54, 1/40;* **C07C** *79/46*

U.S. Cl. 96—29 D **15 Claims**

1. A receiving sheet for a photographic element containing at least one silver halide emulsion layer, which comprises a support carrying a hydrophilic colloid layer containing a compound of the formula:



wherein R is halogen or trifluoromethyl, *n* is 0 to 5, and CD is the residue of a paraphenylenediamine color developer having

a primary amino group available for oxidative coupling, the phenoxycarbonyl group being attached to the primary nitrogen atom of said paraphenylenediamine color developer.

12. In a process for forming diffusion transfer images in color, in which an imagewise exposed photosensitive diffusion transfer element having at least one photographic silver halide emulsion and a color former associated therewith is developed by contact with an aqueous alkaline processing solution to form an imagewise distribution of diffusible color former in unexposed areas of the silver halide emulsion and at least a portion of said diffusible color former is transferred by imbibition to a superposed image receiving sheet, the improvement wherein the receiving sheet is the receiving sheet of claim 1, the receiving sheet is treated with a strong oxidizing agent to oxidize said compound, and a positive dye image is formed by coupling of the color former transferred to the receiving sheet with said oxidized compound to form an indoaniline or azomethine dye.

4,060,419

METHOD OF FORMING SILVER HALIDE GRAINS BY ELECTROLYSIS

Arthur M. Gerber, Boston, and Vivian K. Walworth, Concord, both of Mass., assignors to Polaroid Corporation, Cambridge, Mass.

Filed Apr. 1, 1976, Ser. No. 672,647
Int. Cl.² G03C 1/02; C25B 1/24
U.S. Cl. 96—94 R 34 Claims

34. A method for forming a photographic silver halide emulsion layer which comprises the steps of:

a. the substantially simultaneous generation of silver ions and halide ions in a solution of an electrolyte by electrolysis, employing a silver anode and a cathode which is a source of halide ions;

b. precipitating the ion pairs remote from said anode and cathode to provide silver halide grains in the substantial absence of counterions in said electrolyte;

c. growing said grains to a predetermined size;

d. photographically sensitizing said grains;

e. disposing said grains in a polymeric binder material; and

f. coating said binder and said grains on a support.

4,060,420

SULFONYLACETATE ACTIVATOR-STABILIZER PRECURSOR

Paul Barrett Merkel, and Hans Gway Ling, both of Rochester, N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Aug. 6, 1976, Ser. No. 712,459
Int. Cl.² G03C 1/02, 5/24, 1/34
U.S. Cl. 96—114.1 28 Claims

1. In a heat developable and heat stabilizable photographic element comprising a support having thereon, in reactive association, (a) a photographic silver salt, (b) a photographic silver salt developing agent, (c) a binder, and (d) a stabilizing concentration of an activator-stabilizer precursor having a base portion and an acid portion the improvement wherein said acid portion is an alpha-sulfonylacetate.

4,060,421

COMBINED REVERSIBLE AQUEOUS COLLOIDAL DENTAL IMPRESSION MATERIAL

Ikuji Yoshikawa, 1198, Iwato, Komae, Tokyo; Yoshihisa Noro, 71-16, Narashinodai 4-chome, Funabashi, Chiba, and Junji Okaneya, No. 204, 35-14, Satsukigaoka 1-chome, Chiba, Chiba, all of Japan

Filed May 21, 1976, Ser. No. 688,591
Claims priority, application Japan, Dec. 16, 1975, 50-149713
Int. Cl.² C08L 5/12
U.S. Cl. 106—38.5 D 7 Claims

1. A reversible aqueous colloidal dental impression material emplaceable about a tooth for making an impression thereof, and which effectively bonds to an alginate solidifying material placed therearound in a combined impression process, said reversible impression material comprising:

respective quantities of water and agar-agar;

minor amounts of silicone oil and potassium sulfate for minimizing the formation of rough skin when said impression material is in contact with dental plaster; and

a minor amount of water soluble starch sufficient for causing effective bonding between said impression material and said alginate solidifying material in a combined impression process.

4,060,422

SEALING GLASS FOR GLASS LASER

Yoshiyuki Asahara, Higashiyamato, Japan, assignor to Hoya Corporation, Tokyo, Japan

Filed Dec. 8, 1976, Ser. No. 748,444
Claims priority, application Japan, Dec. 9, 1975, 50-146757
Int. Cl.² C03C 3/16
U.S. Cl. 106—47 Q 1 Claim

1. A sealing glass for a glass laser comprising, in mole percent, 45 to 65% P_2O_5, 15 to 35% ZnO, 5 to 25% PbO, 4 to 12% Li_2O, 1 to 4% Al_2O_3, 0 to 7% Sb_2O_3, 0 to 5% Ag_2O, and 2.0 to 10% V_2O_5.

4,060,423

HIGH-TEMPERATURE GLASS COMPOSITION

George L. Thomas, Bay Village, Ohio, assignor to General Electric Company, Schenectady, N.Y.

Filed July 27, 1976, Ser. No. 708,949
Int. Cl.² C03C 3/04, 3/10
U.S. Cl. 106—52 4 Claims

1. A molybdenum seal glass composition which consists essentially of oxides in approximate percent by weight 55–68 SiO_2, 15–18 Al_2O_3, 7–13 CaO, and 6–16 BaO, along with minor amounts of incidental impurities, residual fluxes, and refining agents, wherein the weight ratio of Al_2O_3 to combined weight ratio of CaO and BaO is about in the range 0.6:1 to 1:1 so as to reside in the eutectic region of this aluminosilicate system, said glass composition having a liquidus temperature no greater than about 1250° C, a strain point of at least about 725° C, and an average coefficient of linear thermal expansion in the 0–300° C temperature range between about 42×10^{-7} cm/cm/° C to about 48×10^{-7} cm/cm/° C.

4,060,424

LOW TEMPERATURE SETTING REFRACTORY CEMENTS

Harriet E. Hofmann, Shrewsbury, Mass., assignor to Norton Company, Worcester, Mass.

Filed Feb. 3, 1976, Ser. No. 654,882
Int. Cl.² C04B 35/10, 35/56, 35/18, 35/04
U.S. Cl. 106—55 1 Claim

1. A low temperature setting dry refractory cement raw batch mix comprising from 95 to 99.5% by weight of a refractory grain selected from the group consisting of aluminum oxide, magnesium oxide, silicon carbide, mullite, spinel, and mixtures thereof, and a low temperature setting bond which is a borosilicate glass having an average particle size of approximately 10 microns, said bond being composed, on a weight basis, of 1 to 65% silicon oxide, 5 to 35% boron oxide, 0 to 25% aluminum oxide, 0 to 25% sodium oxide, 0 to 8% potassium oxide, 0 to 15% calcium oxide, 0 to 4% boric acid, 0 to 10% zinc oxide, 0 to 35% lead oxide, 0 to 45% phosphorous pentoxide, 0 to 15% zirconium oxide, 0 to 10% titanium oxide, and 0 to 20% of an inorganic fluorine compound, said bond having a softening range between approximately 350° to 800° C.

V 964/5 NO29 77 UMI

4,060,425

SUPER RAPID HARDENING MIXTURE

Yutaka Harada; Noriyuki Itai, both of Musashino; Hiroshi Uchikawa, Funabashi; Hajime Kato, Yokohama; Katutoshi Sato, Adachi, and Akira Itoh, Adachi, all of Japan, assignors to Japanese National Railways, Tokyo; Onoda Cement Company Limited, Yamaguchi and Nichireki Chemical Industry Company Limited, Tokyo, all of, Japan

Filed Mar. 31, 1976, Ser. No. 672,511
Claims priority, application Japan, Apr. 5, 1975, 50-40791
Int. Cl.[2] C04B 7/02
U.S. Cl. 106—90 15 Claims

1. A super rapid hardening mixture, comprising

a. a super rapid hardening cement comprising as essential components 1–60 weight % $11CaO.7Al_2O_3.CaX_2$, wherein X is halogen, more than 5 weight % $3CaO.SiO_2$ and $CaSO_4$ such that the weight ratio of Al_2O_3/SO_3 ranges from 0.4–3.0 and such that the upper limit of said $3CaO.SiO_2$ is established by the amounts of said $11CaO.7Al_2O_3.CaX_2$ and $CaSO_4$ present in said cement;

b. at least one short range strength accelerator selected from the group consisting of (b-1) from 1–50 weight % of $CaO.Al_2O_3$, $12CaO.7Al_2O_3$, $3CaO.3Al_2O_3.CaF_2$ or $CaO.2Al_2O_3$, (b-2) from 0.1 – 25 weight % of quick lime or slaked lime, (b-3) from 0.002–2.5 weight % of monoethanolamine, diethanolamine, or triethanolamine, (b-4) from 0.02–1% of monoethyleneglycol, diethyleneglycol, triethyleneglycol or polyethyleneglycol and (b-5) from 0.2–2.5 weight % calcium sulfate hemihydrate with the proviso that Al_2O_3/SO_3 ratio of said mixture is maintained within a range of 0.4–3.0;

c. at least one emulsion selected from the group consisting of from 0.02–3.0 parts by weight of a bituminous emulsion based on the nonvolatile content of the emulsion per one part by weight of the said cement mixture, wherein the bituminous material of said emulsion is selected from the group consisting of straight asphalt, blown asphalt, semi-blown asphalt, propane precipitated asphalt, natural asphalt, bitumen, coal, tar, oil tar, tar pitch, tall oil pitch, fatty acid pitch, heavy oil, rubber-incorporated bitumen and resin-incorporated bitumen; and

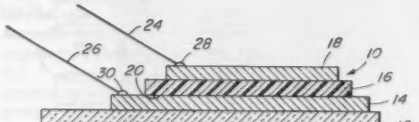
d. from 12 to 50% by weight of water in the total mixture.

4,060,426

TIN INDIUM OXIDE AND POLYVINYLCARBAZOLE LAYERED POLARIZED PHOTOVOLTAIC CELL

Michael Zinchuk, Waltham, Mass., assignor to Polaroid Corporation, Cambridge, Mass.

Continuation-in-part of Ser. No. 485,129, July 2, 1974, abandoned. This application June 14, 1976, Ser. No. 696,027
Int. Cl.[2] H01L 31/06
U.S. Cl. 136—89 NB 4 Claims



1. A polarized photosensitive transducer of the type exhibiting both a photovoltaic and a photoconductive effect comprising:

a transparent substrate;

a first electrically conductive layer disposed on said substrate to a sufficient thickness to display a continuous electrical conductivity throughout while still accommodating the transmission of visible light;

a photoconductive layer comprising a mixture of poly-N-vinylcarbazole and 2,4,7 -trinitro-9-fluorenone deposed on said electrically conductive layer; and

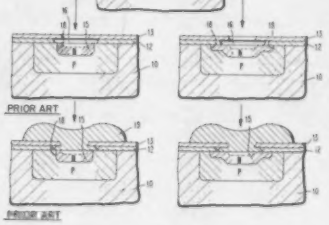
a second electrically conductive layer comprising tin oxide-indium oxide sputtered on said photoconductive layer to a sufficient thickness to display a continuous electrical conductivity throughout while accommodating the transmission of visible light to provide a barrier layer at the boundary between said photoconductive layer and said second layer resulting in said transducer displaying a polarized photovoltaic response regardless of transducer orientation with respect to incident radiation.

4,060,427

METHOD OF FORMING AN INTEGRATED CIRCUIT REGION THROUGH THE COMBINATION OF ION IMPLANTATION AND DIFFUSION STEPS

Conrad A. Barile, Wappingers Falls; Robert M. Brill, Fishkill; John L. Forneris, Lagrangeville, and Joseph Regh, Wappingers Falls, all of N.Y., assignors to IBM Corporation, Armonk, N.Y.

Filed Apr. 5, 1976, Ser. No. 673,314
Int. Cl.[2] H01L 21/265, 21/324
U.S. Cl. 148—1.5 7 Claims



1. In the fabrication of integrated circuits, a method of ion implantation into a semiconductor substrate comprising

forming a bottom layer of an electrically insulative material on a surface of said substrate,

forming an upper layer of another electrically insulative material on said bottom layer,

said upper layer being an ion implantation barrier and more etchable than said bottom layer in selected solvents and said bottom layer being more etchable than said upper layer in selected solvents,

etching at least one aperture through said upper layer to expose said bottom layer,

etching at least one aperture through said bottom layer to expose said surface, said aperture being in registration with and having greater lateral dimensions than said aperture in said upper layer thereby undercutting the upper layer at the periphery of said opening,

ion implanting conductivity-determining impurities of a selected type through said registered apertures into said substrate whereby said opening in said upper layer defines the lateral dimensions of said implantation and the portions of said substrate exposed by said undercutting at the periphery of said opening remain unimplanted, and

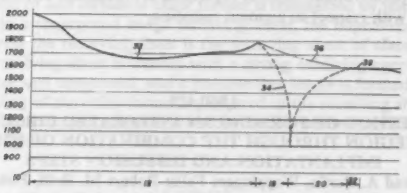
diffusing a conductivity-determining impurity of said selected type through said registered apertures in said substrate whereby said diffusion is made into said unimplanted peripheral portions of said exposed substrate and extends laterally beyond said periphery of the opening in the bottom layer.

4,060,428

PROCESS FOR FORMING FERROUS BILLETS INTO FINISHED PRODUCT

Norman A. Wilson, Shrewsbury, Mass., and Johann Grotepass, Rehweg, Germany, assignors to Morgan Construction Company, Worcester, Mass.

Filed July 30, 1976, Ser. No. 710,023
Int. Cl.² C21D 7/14
U.S. Cl. 148—12 R 9 Claims



1. A process for forming a ferrous billet into a finished product comprising the following steps in sequence:
a. heating the billet to an elevated bulk temperature;
b. hot rolling the heated billet in a rolling mill to produce a semifinished product having an intermediate bulk temperature below said elevated bulk temperature and above a desired finish rolling bulk temperature;
c. subjecting the semifinished product to a cooling operation to lower the surface temperature thereof to a level below said finish rolling bulk temperature;
d. allowing the temperatures of the surface and center portions of the semifinished product to equalize substantially to said desired finish rolling bulk temperature;
e. finish rolling the semifinished product to a finished product; and,
f. subjecting the finished product to further cooling to an ambient bulk temperature.

4,060,429

MANGANESE-NICKEL ALLOYS

Anthony Vincent Dean, Solihull, and Philip James Ennis, Birmingham, both of England, assignors to The International Nickel Company, Inc., New York, N.Y.

Continuation-in-part of Ser. No. 431,676, Jan. 9, 1974, abandoned. This application May 1, 1975, Ser. No. 573,627
Claims priority, application United Kingdom, May 13, 1974, 2516874
Int. Cl.² C22C 22/00, 30/00, 38/58
U.S. Cl. 148—31 8 Claims

3. A substantially non age-hardenable manganese-nickel alloy composition characterized in having been satisfactorily hot worked or cold worked or both and being further characterized by improved resistance to both general corrosion and stress-corrosion cracking, the alloy consisting essentially of from 5 to 15% nickel, 5 to 12% chromium, 30 to 60% iron, up to 2.5% copper, up to 2% lead, up to 1% silicon, up to 0.25% carbon and the balance essentially manganese, the manganese being from 18 to 55%.

4,060,430

PRODUCTION OF FILAMENTS OF HEXAGONAL CLOSE-PACKED METALS AND ALLOYS THEREOF

Sheldon Kavesh, Whippany, N.J., assignor to Allied Chemical Corporation, Morris Township, N.J.

Division of Ser. No. 499,386, Aug. 21, 1974, Pat. No. 3,960,200, which is a division of Ser. No. 306,472, Nov. 14, 1972, Pat. No. 3,845,805. This application Feb. 18, 1976, Ser. No. 659,171
The portion of the term of this patent subsequent to Nov. 5, 1991, has been disclaimed.
Int. Cl.² B22D 11/12
U.S. Cl. 148—32 2 Claims

1. A filament consisting essentially of hexagonal close-packed metals and alloys thereof wherein the <001> axes are oriented at an angle greater than 60° to the filament axis said filament produced by a process which comprises the steps of
a. melting material comprising hexagonal close-packed metals or alloys thereof;
b. extruding a molten filament of the molten material;
c. passing said molten filament in sequence (1) through a controlled gaseous interface zone and (2) into a liquid quench zone, said quench zone comprising a liquid medium which is flowing cocurrently with and essentially as the same velocity as the filament introduced therein; and
d. recovering the solidified filament.

4,060,431

HEAT-TREATABLE STEEL

Helmut Brandis; Albert Von Den Steinen, both of Krefeld, and Serosh Engineer, Tonisvorst, all of Germany, assignors to Thyssen Edelstahlwerke Aktiengesellschaft, Krefeld, Germany

Filed Aug. 17, 1976, Ser. No. 715,203
Claims priority, application Germany, Aug. 23, 1975, 2537702
Int. Cl.² C22C 38/24, 38/26
U.S. Cl. 148—36 2 Claims

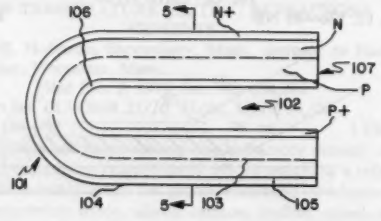
1. A part made of an alloy steel consisting essentially of
0.35% to 0.6% C
0.1% to 0.5% Si
0.3% to 1.0% Mn
0.1% to 0.6% Cr, and
0.01% to 0.1% Nb
balance iron
which after austenisation is rapidly cooled from temperatures above 1000° C. to form a structure consisting principally of martensite and intermediate stage and then reheated to below the A_1 critical temperature, whereby the said part retains its hardness, and has a minimum tensile strength of 700 N/mm² and a notch toughness (DVM test) of at least 55 joules.

4,060,432

METHOD FOR MANUFACTURING NUCLEAR RADIATION DETECTOR WITH DEEP DIFFUSED JUNCTION

Robert N. Hall, Schenectady, N.Y., assignor to General Electric Co., Schenectady, N.Y.

Filed Oct. 20, 1975, Ser. No. 623,974
Int. Cl.² H01L 21/228
U.S. Cl. 148—186 15 Claims



1. A method for manufacturing deep junctions in germanium bodies comprising:
forming a body of high purity p-type germanium having an initial acceptor concentration and
diffusing lithium, from a precalculated concentration of lithium, deep into said body, in the absence of electrolytic processes within said body, to form a junction of high purity n-type germanium and high purity p-type germanium within said body.

4,060,433
FOAM PHOSPHATIZING METHOD AND COMPOSITION

Gerald W. Chunat, Apple Valley, and James E. Maloney, Eagan, both of Minn., assignors to Economics Laboratory, Inc., St. Paul, Minn.

Filed Mar. 5, 1976, Ser. No. 664,165
Int. Cl.[2] C23G 7/08
U.S. Cl. 148—6.17 **19 Claims**

1. A method of phosphatizing a metallic drainable surface, comprising the steps of:

A. providing a mixture comprising:

a. a phosphatizing composition containing at least 0.2% by weight of phosphate anions and having a pH ranging from about 3.0 to about 5.5;

b. at least about 0.25 parts by weight, per 100 parts by weight of said phosphatizing composition, of a high-foaming surfactant having an initial Ross-Miles foam height in excess of 100 mm. determined at 0.1% by weight concentration in water in a column of zero hardness water maintained at 50° C.; and

c. a volume of gaseous fluid which is relatively larger than the combined volume of said phosphatizing composition and said high-foaming surfactant; said gaseous fluid being gaseous at normal ambient temperatures;

B. generating an adherent foam spray comprising the mixture provided by said step (A) and directing said foam spray onto said metallic drainable surface to obtain an adherent foam deposit on said metallic drainable surface;

C. permitting said adherent foam deposit to adhere to said drainable surface until a phosphate coating weight of at least 10mg/ft² is obtained and until said adherent deposit has been in place on said surface for a single-pass, actual dwell time which inherently corresponds to a single-pass, vertical, ASTM D 609–61 panel dwell time of about 10–180 seconds whereby the resulting phosphatized metallic drainable surface, after draining of foam deposits therefrom, has an adherent phosphate coating weight of at least 10mg/ft², but is substantially free of powdery, nonadherent deposits.

11. A method for phosphatizing a three-dimensional object having exposed metallic surfaces comprising the steps of:

a. locating said object so that at least one of the metallic surfaces to be phosphatized is a drainable surface;

b. blending 0.2 to 5 parts by weight of an organic ammonium phosphate with 0.1–1.5 parts by weight of an organic ammonium fluosilicate; 0.01–1.0 parts by weight of a nitrated aromatic accelerator; 0.25–5 parts by weight of a high-foaming surfactant having an initial Ross-Miles foam height in excess of 100 mm. determined at 0.1% by weight concentration in water in a column of zero hardness water maintained at 50° C., selected from the group consisting of an alkyl-aryl sulfonate, an alkyl-phenolethylene oxide adduct, an alkyl ether sulfate, and mixtures thereof; essentially the balance of the resulting mixture being a liquid carrier selected from the group consisting of water, an aromatic liquid solvent, and mixtures thereof; said resulting mixture having a pH ranging from about 3.0 to about 5.5;

c. generating a foam from said mixture of said step (b) and a greater volume of air, relative to the volume of said mixture; and spraying said foam onto a said drainable surface, said volume of air being selected to provide an actual dwell time of foam deposit on said drainable surface, which actual dwell time is at least long enough to provide an adherent phosphate layer on said drainable surface in excess of 10mg/ft² but not long enough to create powdery, non-adherent deposits; said actual dwell time ranging from about 30 seconds to about 20 minutes; and

d. causing downward draining of the foam deposits, resulting from the spraying according to said step (c), on said drainable surface.

18. A foam phosphatizing composition comprising: air and a liquid, said liquid comprising:

Parts by Weight	
0.75–4	Phosphoric acid;
0.01–1.5	an accelerator system comprising a compound selected from the group consisting of a molybdenum oxide, a molybdate salt, a nitrated aromatic sulfonic acid, a nitrated aromatic sulfonate, and mixtures thereof;
0.25–10	at least one high foaming surfactant having an initial Ross-Miles foam height in excess of 100 mm. determined at 0.1% by weight concentration in water in a column of zero hardness water maintained at 50° C., said surfactant selected from the group consisting of an alkyl sulfonate; an alkyl sulfate; an alkyl ether sulfonate; corresponding acids thereof; an alkyl phenoxy polyethoxy ethanol; alkyl, ethyl cycloimidinium, 1-hydroxy, 3-ethyl alcoholate, 2-methyl-carboxylate; alkyl amine oxide; neutralized or non-neutralized polypeptide; and fatty acid diethanol amide;
0–100	organic liquid solvent having a flash point of excess of 85° F. and an initial boiling point in excess of 180° F.;
0–100	water;

said composition further containing about 1–3 equivalents of an amine for each three equivalents of phosphoric acid; the pH of said composition being in the range of about 3.0 to about 5.5, said foam having sufficient volume of air per volume of liquid to provide a foam having a controlled degree of stability and capable of adhering to overhead, inclined or vertical metal surface.

19. A foam phosphatizing composition comprising: gaseous fluid and a liquid, said liquid comprising:

0.75–4.0% by weight phosphoric or polyphosphoric acid; at least about one equivalent of an amine for each 3 equivalents of said acid;

0–1.5% by weight of an agent selected from the group consisting of an accelerator, a debronzing agent, and mixtures thereof;

0–1.5% by weight of a compound of the formula H_2MF_6 wherein M is an element of Group IV A or IV B of the Periodic Table;

at least one high-foaming surfactant having an initial Ross-Miles foam height in excess of 100 mm. determined at 0.1% by weight concentration in water in a column of zero

hardness water maintained at 50° C; and

substantially the balance of said liquid being a liquid carrier selected from the group consisting of water, a substantially hydrocarbon solvent, and mixtures thereof; said gaseous fluid being present in an amount sufficient to provide moderately stiff foam capable of remaining in adherent bonding contact with a vertical metal surface until a phosphate coating weight in excess of 10 mg/ft² is obtained, the pH of said composition being in the range of about 3.0 to about 5.5, said foam being sufficiently wet to flow under the influence of gravity once the adherent bond between the foam and metal surface relaxes or is broken by chemical change.

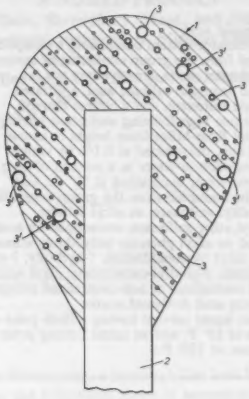
4,060,434
MATCH-HEAD COMPOSITIONS

Albert Frank Lanham, Maidstone; Philip Sydney Barned, Welling, and Sydney Ralph Potter, London, all of England, assignors to Bryant and May, London, England

Filed June 8, 1976, Ser. No. 693,898
Claims priority, application United Kingdom, June 11, 1975, 25019/75
Int. Cl.[2] C06B 45/00
U.S. Cl. 149—2 **9 Claims**

1. In a match-head composition, the improvement which comprises incorporating therein, as a strike sensitizer, from 1-33% by weight of hollow microspheres of siliceous material having a melting point above the combustion temperature of

the match-head composition, said microspheres having diameters in the range 5 to 5000 microns, a sphere density in the



range 0.3 to 0.6 g/cc and a bulk density in the range 0.2 to 0.4 g/cc.

4,060,435

FLOATABLE INCENDIARY COMPOSITION

Fred Schroeder, Lakeview Terrace, Calif., assignor to Dow Corning Corporation, Midland, Mich.

Continuation-in-part of Ser. No. 487,474, July 11, 1974, abandoned. This application June 25, 1975, Ser. No. 590,370

Int. Cl.[2] C06B *45/10, 33/00;* **F42B** *11/24*

U.S. Cl. 149—19.2 **4 Claims**

1. A floating incendiary composition comprising magnesium powder, an oxidizing agent for said magnesium, and a cured elastomeric polysiloxane binder, said composition further comprising a sufficient quantity of hollow microballoons to lower the specific gravity of the composition to less than 1.0, thereby rendering the composition floatable on the surface of water.

4,060,436

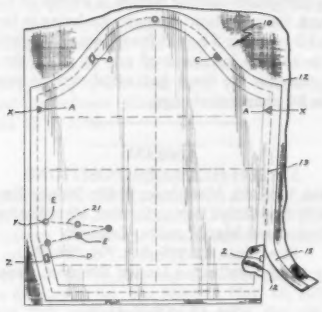
METHOD OF MARKING FOR GARMENT PATTERN

Eunice A. Carlin, 322 N. Mississippi Blvd., St. Paul, Minn. 55104

Filed Dec. 1, 1976, Ser. No. 746,483

Int. Cl.[2] B44C *1/24*

U.S. Cl. 156—63 **3 Claims**



1. A method of applying markings onto material corresponding to garment pattern markings consisting of the steps of

a. forming apertures in a garment pattern at each marking point on said pattern,

b. forming corresponding of said apertures to have like configurations,

c. overlying material with said pattern,

d. forming marking members of material having an adhesive surface,

e. configuring said marking members to conform to said apertures, and

f. disposing said marking members through like of said apertures to secure the same therethrough to said underlying material.

4,060,437

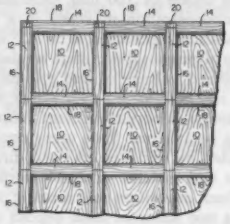
PANELLING METHOD

Theodore M. Strout, 24 Sharon Lane, Wethersfield, Conn. 06109

Filed Mar. 23, 1977, Ser. No. 780,489

Int. Cl.[2] E04F *13/00*

U.S. Cl. 156—71 **7 Claims**



1. A method of panelling a surface comprising the steps of providing a plurality of similar flat rectangular panels each with a contact adhesive on a rear surface thereof, adhesively affixing the panels to the surface in quadrilateral abutting relationship to define continuous linear vertical and horizontal seam lines therebetween, providing first and second groups of similar narrow elongated inner marginal members each having a contact adhesive on a rear surface thereof and a centrally disposed outwardly projecting rectangular tab at each end, dimensioning said tabs so that two end-to-end adjacent and aligned members of one group define opposing rectangular notches adapted to receive and substantially fit the tabs of two aligned members of the other group when said two members of said other group are placed in perpendicular relationship with the members of said one group, providing each of the tabs of at least one of said groups of members with centrally disposed locating means, affixing members of said one group to said panels with each member overlaying a seam between adjacent panels and with the locating means on its tabs aligned with the seam, affixing members of said other group to said panels with each member overlaying a perpendicular seam between adjacent tabs on members of said one group so as to be located and aligned with the seam, providing first and second groups of similar narrow elongated outer marginal members each having a contact adhesive on a rear surface and being slightly narrower than said inner marginal members, and affixing said outer members on and respectively centered and in alignment with said inner members to provide unitary stepped marginal members about all four sides of each panel.

4,060,438

PROCESS FOR IMPARTING COLOR ON A DISCRETE BASIS TO THE THERMALLY FUSED PORTION OF QUILTED SYNTHETIC RESINOUS MATERIALS

Charles A. Johnson, Rockingham, N.C., assignor to Home Curtain Corporation, Far Rockaway, N.Y.

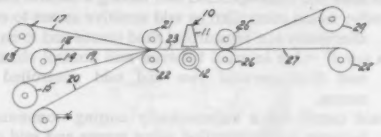
Filed Sept. 2, 1976, Ser. No. 719,910

Int. Cl.[2] B32B *31/20, 31/22*

U.S. Cl. 156—73.1 **6 Claims**

1. A process for imparting color to fused portions of a quilted laminate comprising the steps of: providing quilting

means including a sealing location for effecting fusing of a plurality of heat sealable laminae on a continuous basis; providing a source of web supply for each of said plurality of laminae; providing a source of web supply of a dyestuff-coated transfer



paper; bringing said laminae and said transfer paper into superimposed proximity and moving the same past said sealing location, whereby said laminae are simultaneously sealed and a quantity of dyestuff is transferred to an exposed surface of the resulting laminae in the areas where sealing is effected.

4,060,439

POLYURETHANE FOAM COMPOSITION AND METHOD OF MAKING SAME

Walter Richard Rosemund, Englewood, N.J., and Charles Vincent Rose, Brewster, N.Y., assignors to Union Carbide Corporation, New York, N.Y.

Division of Ser. No. 472,173, May 22, 1974, abandoned. This application Feb. 9, 1976, Ser. No. 656,383

Int. Cl.² B32B *5/18*

U.S. Cl. 156—78 **14 Claims**

1. Method of thermally bonding flexible polyether polyurethane foam to a substrate which comprises:

A. reacting and foaming a composition consisting essentially of

a. a polyisocyanate reactant containing at least two isocyanate groups per molecule;

b. at least one graft copolymer polyether polyol reactant having a molecular weight of at least about 2000 and containing an average of at least two hydroxyl groups per molecule, said graft copolymer polyether polyol having been produced by polymerizing one or more ethylenically unsaturated monomers dispersed in a polyether polyol in the presence of a free radical catalyst;

c. a blowing agent;

d. a catalyst;

e. a surfactant; and

f. about 1 to about 7% based on the weight of graft copolymer polyether polyol (b), of at least one polyol modifier selected from the class consisting of:

1. alkylene glycols having 2 to about 8 carbon atoms;

2. glycol ethers having the empirical formula;

$$HO-[C_nH_{2n}O]_m H$$

wherein n is an integer having values of 2 to 4 and m is an integer having values of 2 to 4 when n is 2, 2 to 3 when n is 3 and 2 when n is 4;

3. triols having the empirical formula:

$$C_xH_{2x-1}(OH)_3$$

wherein x is an integer having values of 3 to about 10;

4. alkanolamines having the empirical formula:

$$C_yH_{2y}N_z(OH)_p$$

wherein y is an integer having values of 2 to about 10, z is an integer having values of 1 to 2 and p is an integer having values of 2 to 4; and

5. polyhydric mononuclear phenols;

B. Heating the surface of the foamed composition of (A) above its melting or fusion point;

C. Contacting the melted or fused surface of the foamed composition of (A) with a substrate whereby a flexible polyurethane foam/substrate laminate is formed; and

D. Cooling the flexible polyurethane foam/substrate laminate below the melting or fusion point of the flexible polyurethane foam.

4,060,440

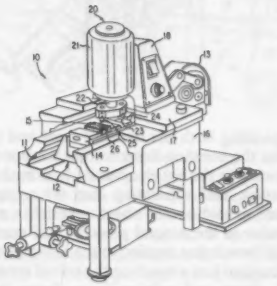
METHOD OF SPECIMEN PREPARATION

Werner Behme, Walldorf, and Manfred Berleth, Eppelheim, both of Germany, assignors to R. Jung AG Fabrik fur Prazisionsapparate, Heidelberg, Germany

Continuation of Ser. No. 625,961, Oct. 28, 1975, abandoned, which is a division of Ser. No. 453,142, March 20, 1974, abandoned. This application June 6, 1977, Ser. No. 804,197

Int. Cl.² B32B *31/18*

U.S. Cl. 156—154 **1 Claim**



1. A method of preparing a thin specimen section in a microtome having a rotary milling cutter for microscopic studies in a transmitted light microscope comprising mounting a specimen to be prepared for examination on the slide means of said microtome, advancing said specimen relatively toward said rotary milling cutter of said microtome in a plane parallel to the plane of said rotary milling cutter of said microtome, removing a predetermined thickness of material of said specimen by cutting by said rotary milling cutter thereby to achieve a mirror-smooth and roughness-free, flatly-reduced specimen surface, removing said specimen from said slide means, affixing said reduced surface to an examination slide holder, further mounting said specimen on said examination slide holder to said slide means of said microtome, advancing said specimen generally horizontally relatively toward said rotary milling cutter of said microtome, removing a predetermined thickness of material of said specimen by cutting by said rotary milling cutter thereby to achieve a specimen slide having a layer thickness which accommodates microscopic examination in transmitted light.

4,060,441

METHOD FOR FORMING A TRANSPARENT PROTECTIVE COATING ON A PHOTOGRAPH OR THE LIKE

Wasaburo Ohta, and Tatsuya Watanabe, both of Tokyo, Japan, assignors to Kabushiki Kaisha Ricoh, Tokyo, Japan

Division of Ser. No. 448,555, March 6, 1974, abandoned. This application July 8, 1975, Ser. No. 594,182

Claims priority, application Japan, Apr. 20, 1973, 48-44914; May 1, 1973, 48-49479

Int. Cl.² B32B *31/20*

U.S. Cl. 156—234 **26 Claims**

1. A method of forming a protective coating on a sheet material, comprising the steps of:

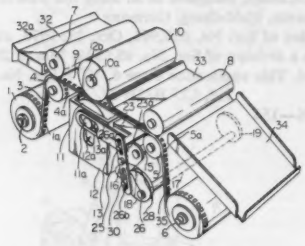
a. preparing a coating material by forming a releasing layer on a heat resistant backing sheet and then releasably adhering a transparent thermal bonding layer onto the re-

leasing layer, the bonding layer comprising a material selected from the group consisting of vinyl choloride, vinyl acetate and polyamide;

b. maintaining the coating material in a state of tension;

c. placing the sheet material and the coating material together so that the bonding layer is in face-to-face contact with the sheet material;

d. applying heat and pressure to bond the bonding layer to the sheet meterial; and



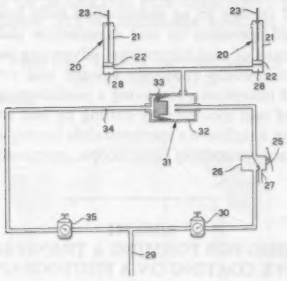
e. separating both the backing sheet and the releasing layer from the bonding layer so that the bonding layer remains bonded to the sheet material to constitute the protective coating, said separating step (e) comprising applying a force to said coated sheet material in a direction perpendicular to the general plane of said coated sheet material, said force being applied to the said coated sheet material at a location just preceding the actual separation of the backing sheet and release layer from the bonding layer, whereby said applied force facilitates separation of said backing sheet and release layer from said bonding layer.

4,060,442

MACHINE FOR SEALING PARALLELEPIPEDAL BOXES HAVING A VARIABLE HEIGHT

Augusto Marchetti, Piazza Sicilia, 7 Milan, Italy

Filed Nov. 3, 1976, Ser. No. 738,511
Claims priority, application Italy, Nov. 28, 1975, 29840/75
Int. Cl.² G05G *15/00*
U.S. Cl. 156—358 **3 Claims**



1. A machine for sealing parallelpipedal boxes of different heights comprising

a rest plane for the boxes,

conveyor means to advance the boxes along said rest plane from an inlet section of said conveyor means,

a tape-applying head mounted for vertical displacement above said rest plane and for thrust by its own weight toward a position of maximum depression,

lifting means to lift said tape-applying head from the position of maximum depression,

sensitive means carried by said tape-applying head and engageable by a front wall of each of the boxes coming from said inlet section of said conveyor means to control the instanteous actuation of said lifting means to vertically displace said tape-applying head to a distance above said rest plane which is higher than the height of the box engaging said sensitive means,

said lifting means including

at least one fluid-operated ram having a control chamber,

valve means controlled by said sensitive means to connect alternately to a pressurized fluid source and to an outlet,

a cutoff valve inserted between said control chamber of said fluid-operated ram and said controlled valve means,

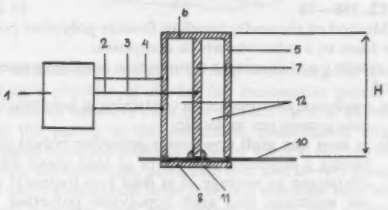
said cutoff valve automatically cutting communication between said controlled valve means and said control chamber of said ram whereas the pressure within said control chamber of said ram drops below a preselected magnitude.

4,060,443

DEVICE FOR THE HEAT-SEALING OF THERMOPLASTIC MATERIAL OR PAPER MATERIAL COATED WITH THERMOPLASTICS

Gyula Balla, Malmo, Sweden, assignor to Tetra Pak International AB, Lund, Sweden

Filed Apr. 23, 1973, Ser. No. 353,376
Claims priority, application Sweden, May 23, 1972, 6722/72
Int. Cl.² H05B *7/06, 9/04*
U.S. Cl. 156—380 **6 Claims**



1. A device for heat sealing at least two layers of a thermoplastic material comprising a metal body having at least two substantially parallel side walls, a first metal wall connected to said side walls, a second metal wall connected to said first wall substantially equidistant from said side walls, a coaxial cable having a central conductor, a shield conductor, said central conductor being connected to said second wall, and shield conductor being connected to one of said side walls and means connecting said coaxial cable to a high frequency generator and a metal yoke connected to and spaced from said side walls to provide a space therebetween for the passage of a web of material.

4,060,444

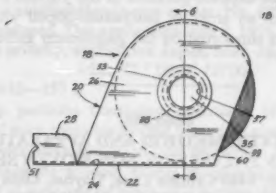
TAPE APPLICATOR

Eugene S. Schweig, Jr., 6900 Washington, St. Louis, Mo. 63130, and Marcus I. Diehl, 7023 Florence, St. Louis, Mo. 63136

Continuation of Ser. No. 600,459, July 30, 1975, abandoned.
This application Mar. 14, 1977, Ser. No. 777,393
Int. Cl.² B44C *7/02;* B65H *19/02*
U.S. Cl. 156—391 **22 Claims**

1. A tape applicator for applying tape to a surface, said applicator comprising a frame, means for rotatably supporting at least one tape roll within said frame for permitting withdrawal of said tape from said roll, a flat elongated pressure surface located at the bottom of the frame for sliding pressure engagement of at least a substantial portion of said pressure surface with the upper side of said tape as said applicator is pushed forwardly over said surface, said elongated pressure surface having a forwardly extending portion adapted for the placement of the ends of the index and middle fingers of one hand which extend forwardly thereto from above the frame for

applying pressure during operation of the applicator, and means located near the points of pressure contact by said fingers for guiding said tape from said roll and into contact with the surface to which the tape is to be applied, the bottom side of the tape contacting the surface adjacent the points of



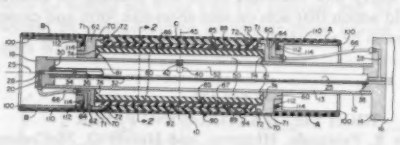
pressure contact of the fingers, said guide means further guiding the tape rearwardly under said elongated pressure surface as said fingers apply pressure at the point of initial tape contact with the surface as said applicator is pushed forwardly over said surface to which the tape is to be applied.

4,060,445

BUILDING DRUM FOR TIRES AND CYLINDRICAL ARTICLES HAVING AXIALLY SPACED BEADS

Staley J. Houck, Akron, and Michael W. Smith, Mogadore, both of Ohio, assignors to The Goodyear Tire & Rubber Company, Akron, Ohio

Filed Aug. 25, 1975, Ser. No. 607,325
Int. Cl.² B29H *17/16, 17/22*
U.S. Cl. 156—414 **1 Claim**



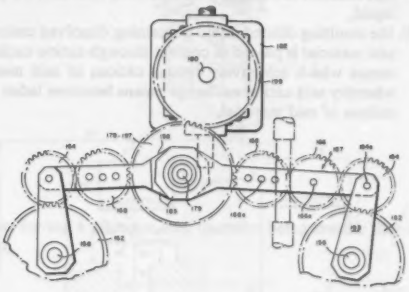
1. A building drum for tires, airsprings, and like articles, said drum being free of and operable without axially movable rigid parts and comprising a center shaft, a pair of axially spaced apart rigid end rings each having a circumferentially and axially continuous cylindrical extension coaxially fixed thereon and an integral annular flange projecting axially toward the other end ring and terminating outwardly of the nearer bead ring of a pair thereof in such tire, airspring or like article intended to be built on the drum, a radially extensible sleeve disposed around the shaft between the end rings and terminating in sealing engagement with the respective end rings to form an air pressure chamber, a plurality of control members disposed axially and circumferentially of said sleeve, being engageable with said flanges on radial expansion of said sleeve and being stiff parallel to said shaft but flexible radially thereof, a unitary thick-wall cylinder of elastically deformable rubbery material for partially enveloping a bead ring or pair of bead rings disposed circumferentially therearound at any selected axial location therealong between the respective flanges, said cylinder being disposed around said control members and extending axially from one to the other of said flanges, and a single axially and circumferentially continuous elastic membrane providing a cylindrical building surface for accommodating a ply thereon and extending around and axially along said cylinder, said end rings and said cylindrical extensions to the respective ends of said extensions and thence axially inwardly along and in circumferential contact with the respective extensions, its ends being fixed adjacent the respective end rings, whereby portions of said membrane axially outwardly of bead rings partially enveloped by said cylinder can be moved axially to turn ply endings about said bead rings.

4,060,446

APPARATUS EMBODYING CONTINUOUS CONVEYORS FOR APPLYING LABELS TO CONTAINERS

Sidney T. Carter, Shrewsbury, Mass., assignor to A-T-O Inc., Cleveland, Ohio

Division of Ser. No. 493,217, July 31, 1974, Pat. No. 3,954,549.
This application Jan. 21, 1976, Ser. No. 651,136
Int. Cl.² B29C *17/00*
U.S. Cl. 156—475 **2 Claims**



1. In a labeling apparatus, a container conveyor traveling along a predetermined horizontal path for moving containers along said path, a support at each side of the conveyor movable toward and from the container conveyor, endless chains, bearing members at each end of each support, a sprocket shaft rotatably mounted in each bearing member in a vertical position, a sprocket fixed to the upper and lower ends of each sprocket shaft, said chains being entrained about said sprockets in vertically spaced parallel relation, wiper assemblies including wiper pads pivotally mounted between the chains with the pads projecting outwardly from the chains, means for effecting movement of the supports toward and from each other relative to the container conveyor, a common drive gear, means drivably connecting the sprocket shafts at one end to said common drive gear without interfering with movement of the movable supports relative to the container conveyor and continuous uninterrupted drive comprising a first gear fixed to the sprocket shaft and means drivably connecting each of the sprocket shafts to the common drive gear comprising articulated supports pivotally connected at their distal ends for pivotal movement about the axis of the common gear and axes of the sprocket shafts and trains of gears, the gear at one end of each train being rotatable about the pivot connecting the proximal ends of the articulated supports and in mesh with the first gear and the gear at the other end of the train being in mesh with the common drive gear and means for effecting adjustment of the distance between said sprocket shafts comprising vertically spaced parallel cam plates mounted on the supports within the chains containing cam surfaces at their opposed sides, cam rolls mounted on the assemblies inwardly of the pivots engaged with said grooves, the cam plates being divided intermediate their ends such as to enable adjusting the distance between the shafts mounting the sprockets and means for effecting adjustment of the distance between said shaft.

4,060,447

PROCESS FOR ETCHING OF METAL

Warren A. Nelson, Hohokus, N.J., assignor to Philip A. Hunt Chemical Corporation, Palisades Park, N.J.

Filed Mar. 29, 1976, Ser. No. 671,310
Int. Cl.² C23F *1/00*
U.S. Cl. 156—642 **14 Claims**

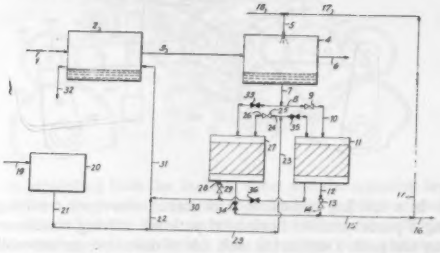
1. In an etching process in which
A. a material is dissolved as cations from a surface of a body in an etcher by contact with an etching solution, said etching solution containing
I. an active etchant and
II. dissolved cations of such material,

B. a stream of aqueous replenishing solution containing a lesser concentration of such cation than said etching solution is passed into said etcher, and some etching solution is removed,

C. said body is
   I. withdrawn from said etcher and
   II. rinsed with a liquid,

D. whereby residual etching solution containing cations of said material is washed from said body and diluted by said liquid,

E. the resulting diluted liquid containing dissolved cations of said material is passed in contact through cation exchange means which selectively retains cations of said material whereby said cation exchange means becomes laden with cations of said material,



F. said cation exchange means is regenerated by
   I. terminating the flow of said resulting liquid and
   II. then passing a regenerating solution stream through said cation exchange means to remove cations of said material from said cation exchange means, the improvement of:

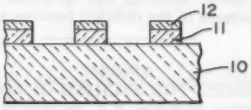
G. regenerating said cation exchange means by
   I. passing at least a portion of said replenishing solution stream through said cation exchange means
   II. before passing said replenishing solution portion into said etcher,
   III. whereby cations of said material are removed from said cation exchange means and introduced into said replenishing solution stream portion.

4,060,448

YTTRIUM IRON GARNET DISKS ON GADOLINIUM GALLIUM SUBSTRATES FOR MICROWAVE APPLICATIONS

Michael Nemiroff, Solana Beach, Calif.; Hong Jun Yue, Bud Lake, N.J., and William Russell Schevey, Honesdale, Pa., assignors to Allied Chemical Corporation, Morris Township, N.J.

Filed Jan. 28, 1977, Ser. No. 763,964
Int. Cl.² B44C *1/00*; C03C *15/00*; C23F *1/02*
U.S. Cl. 156—653 **15 Claims**



1. A process for fabricating microwave electronic devices comprising yttrium iron garnet disks which comprises

a. forming a thin film of yttrium iron garnet, doped with about 0.5 to 1.5 atom percent of trivalent lanthanum ions, on a gadolinium gallium garnet substrate;

b. forming a thin layer of SiO_2 on the lanthanum-doped yttrium iron garnet layer;

c. forming a photoresist mask layer on the SiO_2 layer;

d. removing portions of the photoresist mask layer to expose portions of the underlying SiO_2 layer;

e. removing the exposed portions of the SiO_2 layer to expose portions of the underlying lanthanum-doped yttrium iron garnet film; and

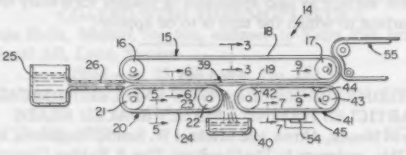
f. removing the exposed portions of the yttrium iron garnet film to form an array of lanthanum-doped yttrium iron garnet disks supported on the gadolinium gallium garnet substrate.

4,060,449

ELECTROSTATIC METHOD AND APPARATUS FOR MAKING A PATTERNED, NON-WOVEN SHEET

James T. Candor, 5440 Cynthia Lane, Dayton, Ohio 45429

Filed Oct. 10, 1973, Ser. No. 405,023
The portion of the term of this patent subsequent to Aug. 31, 1993, has been disclaimed.
Int. Cl.² D21H *5/06*
U.S. Cl. 162—109 **20 Claims**



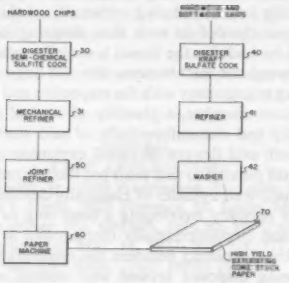
1. A method of making a patterned non-woven sheet comprising the steps of providing a slurry of fluid and fibers, forming said slurry into sheet-like form, and creating an electrostatic field action that acts on said sheet-like form and causes said fibers to be arranged into a predetermined pattern.

4,060,450

HIGH YIELD SATURATING PAPER

Salvatore E. Palazzolo, Hampton, and Harold O. McCaskey, Jr., Allendale, both of S.C., assignors to Westinghouse Electric Corporation, Pittsburgh, Pa.

Division of Ser. No. 285,697, Sept. 1, 1972, Pat. No. 3,940,538. This application Apr. 11, 1975, Ser. No. 567,221
Int. Cl.² B32B *5/14*
U.S. Cl. 162—141 **8 Claims**



1. A resin saturable paper sheet with an apparent density of about 2.7 – 3.1 and an air porosity of about 5–15 seconds, having an essentially homogeneous distribution of both hardwood and softwood cellulosic fibers and essentially free of wood slivers, containing from about 8 up to 15 percent total lignin based on total weight, at least about 65 percent of said fibers being hardwood fibers, a major portion of said lignin being hardwood lignin, the softwood lignin not exceeding about 2.8 percent of the total weight.

V 9 6 4 / 5 N 0 2 9 7 7 UMI

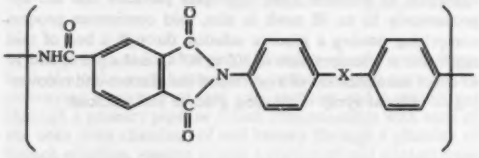
4,060,451

POLYAMIDE-IMIDE AND MICA PULP PARTICLES AND PAPER-LIKE SHEETS MADE THEREFROM

Shuichi Uchiyama; Satoshi Utsunomiya, and Hideo Watase, all of Hino, Japan, assignors to Teijin Limited, Osaka, Japan

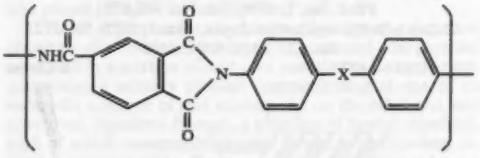
Continuation of Ser. No. 492,136, July 26, 1974, abandoned, which is a continuation-in-part of Ser. No. 345,287, March 27, 1973, abandoned. This application July 8, 1976, Ser. No. 703,364
Claims priority, application Japan, Mar. 31, 1972, 47-32407
Int. Cl.² D21F *11/00*
U.S. Cl. 162—157 R 17 Claims

1. Pulp particles consisting essentially of 50 to 90% by weight of mica particles having a particle size in a range of 60 - 3000 Tyler mesh and 50 to 10% by weight of a film-forming polyamide-imide at least 70 mol % of which recurring units consist of at least one or more of recurring units of the following formula



wherein X is —O— or —CH_2— in which said polyamide-imide forms a continuous phase and said mica particles are dispersed discontinuously in said continuous phase.

10. Pulp particles consisting essentially of 50 - 90% by weight of mica particles having a particle size such that at least 90% by weight are from 1 to 150 microns, and 50 - 10% by weight of a film-forming polyamide-imide having recurring units which consist essentially of



wherein X is —O— or —CH_2— in which said polyamide-imide forms a continuous phase and said mica particles are dispersed discontinuously in said continuous phase.

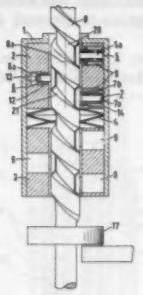
4,060,452

POSITIONING DRIVE FOR ABSORBER RODS OF A NUCLEAR REACTOR

Heinz Acher, Friedberg, Germany, assignor to Kraftwerk Union Aktiengesellschaft, Mulheim (Ruhr), Germany

Filed Dec. 11, 1975, Ser. No. 613,527
Int. Cl.² G21C *7/08*
U.S. Cl. 176—36 R 9 Claims

1. A nuclear absorber and positioning drive comprising a spindle having a longitudinal axis and at least one screw thread having sides and a crest, said thread being engaged by a traveling nut having anti-friction bearing means engaging said sides; wherein the improvement comprises said bearing means comprising at least three rollers having axes at right angles to the spindle's said axis, a traveling-nut housing, and low-friction bearing members journaling said rollers to said housing so that said rollers are interspaced circumferentially around said spindle and so that said rollers are interspaced longitudinally with respect to said axis, said housing containing at least two nut bodies to which said rollers are journaled by said bearing members with at least three of the rollers to each nut body, and means for elastically thrusting said nut bodies apart, said screw thread having a width between adjacent convolutions and said



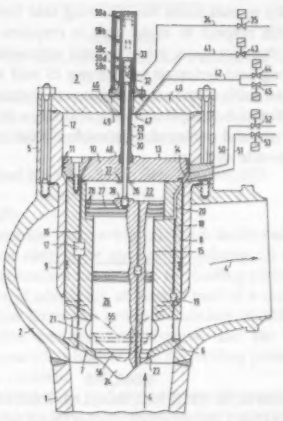
rollers having a diameter, said diameter being smaller than said width.

4,060,453

NUCLEAR REACTOR INSTALLATION

Hans-Peter Schabert, Erlangen, and Erwin Laurer, Mohrendorf, both of Germany, assignors to Kraftwerk Union Aktiengesellschaft, Mulheim (Ruhr), Germany

Filed Apr. 21, 1976, Ser. No. 679,078
Claims priority, application Germany, Apr. 30, 1975, 2519376
Int. Cl.² G21C *9/00*
U.S. Cl. 176—38 16 Claims



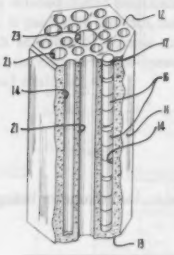
1. In a nuclear reactor installation having a containment shell, a live steam line leading outwardly from the containment shell, a fast-acting shut-off valve connected in the steam line and having a flow cross section corresponding to the cross section of the steam line, the shut-off valve including a normally open main valve disk which is actuatable to close in response to pressure from a leak in the steam line, pressure dependent means associated with the main valve disk for sensing a pressure higher than operating pressure of the steam line, an opening mechanism comprising a piston-actuated auxiliary valve disk disposed in a cut-out formed in the main valve disk and having an area equal at most to one-half the flow cross-sectional area of the shut-off valve, said auxiliary valve disk being operable by said pressure-dependent means to open said cut-out opening when a pressure higher than operating pressure of the steam line is sensed by said pressure dependent means.

4,060,454

NUCLEAR FUEL ELEMENT AND METHOD FOR MAKING SAME

Gary N. Miertschin, San Diego, and Kenneth F. Powell, Cardiff, both of Calif., assignors to General Atomic Company, San Diego, Calif.

Filed Apr. 7, 1975, Ser. No. 565,868
Int. Cl.² G21C 5/00
U.S. Cl. 176—84 6 Claims



1. A nuclear fuel element comprising, a block comprised substantially of graphite and having opposite surfaces thereon, said block having a plurality of longitudinal passages therethrough for flowing coolant, said block having a plurality of elongated fuel holes therein separate from said longitudinal passages substantially parallel therewith extending from one of said opposite surfaces and terminating spaced from the other of said opposite surfaces, a plurality of substantially cylindrical fuel rod segments in each of said holes engaging the sides thereof with sufficient friction to hold said fuel rod segments in place axially in said holes but allowing said fuel rod segments to slide with respect to said block in response to differential shrinkage therebetween, said fuel rod segments being spaced axially along said holes, at least some of said segments being spaced from each other axially distances forming void spaces the total of which compensates for shrinkage of said block due to irradiation, and a plug closing each of said holes at said one of said opposite surfaces.

4,060,455

PROCESS FOR THE MICROBIAL PRODUCTION OF L-SERINE USING PSEUDOMONAS SP. DSM 672

Fritz Wagner, Braunschweig-Stockheim; Hermann Sahm, Wolfenbuttel, and Walter Hartmut Keune, Braunschweig, all of Germany, assignors to Gesellschaft fur Biotechnologische Forschung mbH, (GBF), Braunschweig-Stockheim, Germany

Filed Dec. 6, 1976, Ser. No. 747,725
Claims priority, application Germany, Dec. 4, 1975, 2554530
Int. Cl.² C12D 13/06
U.S. Cl. 195—29 14 Claims

1. A process for the production of L-serine in which methanol and glycine are mixed with a submerse culture containing inorganic nutrients and the bacterium Pseudomonas sp. DSM 672 and/or L-Serine accumulating mutants of this bacterium in a reactor supplied with a gas which is air or oxygen-enriched air at a pH in the range 6.0 to 9.0 and at a temperature in the range 20° to 40° C, the mixture is allowed to react, the resulting cell mass is separated from the culture filtrate and the L-serine is isolated from the culture filtrate.

4,060,456

GLUCOSE ISOMERIZATION PROCESS

Margaret E. Long, Winston-Salem, N.C., assignor to R. J. Reynolds Tobacco Company, Winston-Salem, N.C.

Continuation of Ser. No. 320,034, Jan. 2, 1973, abandoned, which is a continuation-in-part of Ser. No. 161,337, July 9, 1971, Pat. No. 3,821,086. This application Oct. 14, 1975, Ser. No. 621,713
The portion of the term of this patent subsequent to June 28, 1991, has been disclaimed.
Int. Cl.² C12D 13/00
U.S. Cl. 195—31 F 9 Claims

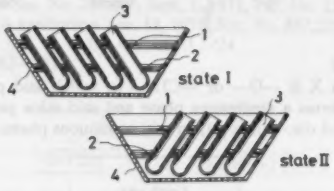
1. A continuous process for isomerizing glucose to fructose in the presence of glucose isomerase-containing microbial cells wherein said cells are used in the form of an aggregate resulting from prior treatment of said cells with 0.5 to 50 percent by weight based on the wet weight of said cells of a polyelectrolyte flocculating agent followed by drying and sieving of the aggregate to produce dried aggregate particles that are approximately 10 to 30 mesh in size, said continuous process comprising passing a glucose solution through a bed of said aggregate at a temperature of 50° to 90° C. and a pH of 6 to 10 to effect isomerization of a portion of the glucose and recovering an effluent syrup containing glucose and fructose.

4,060,457

APPARATUS FOR GROWING ANIMAL CELLS

Masahiko Iizuka, Fujisawa; Jiro Suzuki, and Sigeyasu Kobayashi, both of Kamakura, all of Japan, assignors to Ichiro Kojima, Tokyo, Japan

Filed Jan. 7, 1976, Ser. No. 647,177
Claims priority, application Japan, Jan. 7, 1975, 50-4272
Int. Cl.² C12K 9/00, 1/10
U.S. Cl. 195—127 8 Claims



1. An apparatus for growing animal cells, said apparatus comprising:

a. a plurality of small vessels, each said vessel having a hole in the lower portion thereof;

b. a box reservoir; and

c. vessel holder means including an upper panel and a lower panel mounted in said box reservoir, said upper panel and said lower panel each including holding means for cooperating with each other to hold each of said vessels, wherein at least one of said panels can be moved horizontally with respect to the other of said panels such that the angle of the axis of each said vessel when in said holder means can be set parallel to one another at 30°–60° on either side of the vertical by the horizontal movement of said panels with respect to one another, and wherein said hole is positioned in said vessel such that it is at the lowest point of said vessel when said vessel is tilted to one side of the vertical by said holder means.

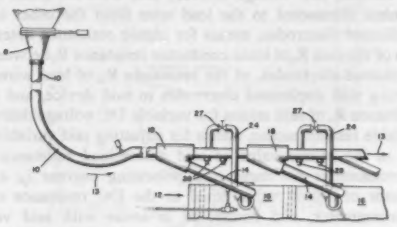
V 964/5 N029 77 UMI

4,060,458

SEPARATION OF GAS FROM SOLIDS

Rufus F. Davis, Jr., Russell, Ky., assignor to Coaltek Associates, Morris Township, N.J.

Filed Dec. 24, 1975, Ser. No. 643,964
Int. Cl.[2] C10B *31/04*
U.S. Cl. 201—40 4 Claims



1. In a method for charging a plurality of coke oven chambers of a coke oven battery with preheated coal particles by conveying a mixture of said coal particles and a carrier gas through a primary pipeline which communicates with each of the coke oven chambers of said battery through a plurality of branch pipelines, passing at least a portion of said mixture from said primary pipeline into a branch pipeline communicating with a coke oven chamber to be charged while the remaining portion of said mixture continues to be conveyed in said primary pipeline downstream from said branch pipeline, and removing a portion of said carrier gas from said mixture in said branch pipeline prior to introducing said mixture into said coke oven chamber to be charged by said branch pipeline; the improvement comprising reintroducing the carrier gas removed from said branch pipeline into the primary pipeline conveying the remaining portion of said mixture at a point downstream from where that portion of said mixture in the primary pipeline was passed into said branch pipeline.

3. In an apparatus for charging a plurality of coke oven chambers of a coke oven battery with preheated coal particles contained in a mixture of said coal particles and a carrier gas comprising a primary pipeline communicating at one of its ends with a source of said mixture and on the other end said coke oven chambers through a plurality of branch pipelines, each of which communicates with a coke oven chamber, diverting means in said primary pipeline for diverting at least a portion of said mixture from said primary pipeline to a branch pipeline and means in said branch pipeline for removing from said branch pipeline a portion of the carrier gas from said mixture prior to introducing said mixture into a coke oven chamber; the improvement wherein said means for removing a portion of carrier gas from said branch pipeline comprises a bleed-off pipeline connected at one of its ends to said branch pipe line and connected at its other end to said primary pipeline downstream of said diverter means for said branch pipeline.

4,060,459

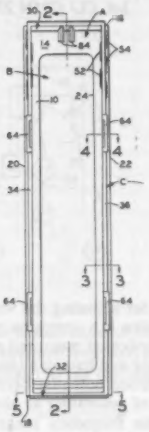
COKE OVEN DOOR FRAME AND JAMB

Patsie Carmen Campana, 2614 Sherwood Drive, Lorain, Ohio 44053

Filed July 6, 1976, Ser. No. 703,111
Int. Cl.[2] C10B *25/02*
U.S. Cl. 202—248 9 Claims

1. In a coke oven of the type having an elongated vertical opening in the front wall thereof with a frame received thereover which has a coke oven opening in the central portion thereof adapted to operably receive a coke oven door in a covering relationship therewith and wherein said frame has generally flat inner and outer faces, a top edge, a bottom edge and opposed elongated side edges with a jamb disposed about at least a portion of said outer face adjacent the outer peripheral edges thereof, the improvement comprising:

said frame outer face including a groove extending longitudinally therealong adjacent each side edge, said grooves having a width *x* and a groove bottom wall; an elongated side jamb member received in each of said grooves against said groove bottom walls with said side jamb members having a thickness *y* which is less than width *x* such that a



clearance area is provided between the portions of said side jamb members received in said grooves and the side walls of said grooves with said side jamb members extending outwardly of said frame outer face and being rigidly affixed thereto; and, said frame and at least said side jamb members being constructed from mild steel plate.

4,060,460

REMOVAL OF CHLOROPRENES FROM ETHYLENE DICHLORIDE

Edmund W. Smalley, Brewerton; Bruce Edward Kurtz, Marcellus, and Bhaskar Bandyopadhyay, Camillus, all of N.Y., assignors to Allied Chemical Corporation, Morris Township, N.J.

Filed May 22, 1975, Ser. No. 580,077
Int. Cl.[2] C07C *17/38*
U.S. Cl. 203—29 6 Claims

1. In a process for recovering ethylene dichloride from an impure ethylene dichloride stream containing (i) impurities boiling at a temperature lower than the boiling point of ethylene dichloride and consisting at least in part of a chloroprene-impurity selected from the group consisting of chloroprene, alpha-chloroprene and mixtures thereof, and (ii) impurities boiling at a temperature higher than the boiling point of ethylene dichloride, wherein

a. said impure ethylene dichloride stream is passed to a first distillation zone and distilled therein under conditions sufficient to provide (1) first distillate containing said lower boiling impurities and (2) first bottoms containing ethylene dichloride together with said higher boiling impurities, and

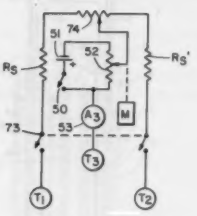
b. said first bottoms is passed to a second distillation zone and distilled therein under conditions sufficient to provide (1) second distillate containing ethylene dichloride and (2) second bottoms containing said higher boiling impurities, the improvement which comprises chlorinating at least the portion of said chloroprene-impurity by introducing into said first distillation zone, during the distillation of ethylene dichloride therein, a gas containing elemental chlorine, thereby producing chloroprene reaction products having a boiling point higher than the boiling point of ethylene dichloride, and withdrawing said chloroprene reaction products with said first bottoms for passage to a second distillation zone.

4,060,461

METHOD AND APPARATUS FOR CORRECTING ERROR IN CORROSION RATE MEASUREMENTS

Robert G. Seyl, 1123 Mulford St., Evanston, Ill. 60202

Continuation-in-part of Ser. No. 530,870, Dec. 9, 1974, Pat. No. 3,947,329. This application Feb. 3, 1976, Ser. No. 654,854
Int. Cl.[2] G01N 27/46
U.S. Cl. 204—1 T 10 Claims



1. The method for adjusting the value of a variable resistor for IR loss correction in a corrosion current measuring device operating with duplicated measured electrodes in a non-gaseous ionic conductor and having a circuit for equalizing difference in free electrode potential between said electrodes, including the steps of generating an alternating current voltage selected within the frequency range of about 400 to 1,000 Hertz, delivering said AC voltage to a potentiometer for adjustment of voltage output, leading one output terminal through a full-wave rectifier with DC output to a microammeter, and to one pole of a selector switch, leading the other output terminal through a blocking condenser to another pole of said selector switch, before immersing said electrodes in said ionic conductor, connecting the DC power supply to said circuit for equalizing difference in free electrode potential to establish its operating DC resistance, advancing said selector switch from contact position zero to position one to connect one of said poles to one of said electrodes through the lead wire from said electrode, and to connect the other of said poles to the other of said electrodes through said circuit for equalizing difference in free electrode potential and through the lead wire from said other electrode, adjusting said potentiometer to produce a measured and noted value of current through said microammeter, advancing said selector switch to contact position two to connect said poles across a variable condenser, adjusting the capacity of said variable condenser to produce through said microammeter the value of current noted above, thereby determining and storing the distributed capacity C_v of said lead wires, and returning said selector switch to contact position zero until later operation in resistance measurement, at a selected time after immersion of said electrodes in said ionic conductor and immediately before corrosion current measurements of corrosion rate measurement, advancing said selector switch to contact position one, adjusting said potentiometer to produce a second measured and noted value of current through said microammeter, then advancing said selector switch to position three to connect said poles to said stored capacity C_v and to a variable resistor, adjusting said variable resistor to produce said second measured and noted value of current through said microammeter, and returning said selector switch to contact position zero, whereby said variable resistor is adjusted to equal the sum of ionic conductor resistance R_i between said electrodes, of lead wire resistance R_w connecting said electrodes to said corrosion current measuring device, and of the resistance R_s of said circuit for equalizing free electrode potential between said electrodes.

2. A device for measuring unaccelerated and accelerated corrosion rates of an electronic conductor immersed in a non-gaseous ionic conductor, including an electrode probe with two duplicated electrodes positioned at uniform separation distance, a third electrode positioned at uniform equidistant separation distance from said two duplicated electrodes, a lead wire from the end of each of said electrodes, and a corrosion resistant electrical insulator holding each of said electrodes in position at the end of lead wire connection, means for variable DC voltage delivery throughout a selected voltage range that extends from zero in both plus and minus polarity, with one output terminal connected to a lead wire from one of said duplicated electrodes, a double-pole-double-throw switch with center-off position, wired for polarity reversal with one output terminal connected to the other output terminal of said means for variable DC voltage delivery and with the other output terminal connected to the lead wire from the other of said duplicated electrodes, means for ohmic resistance determination of the sum R_i of ionic conductor resistance R_i between said duplicated electrodes, of the resistance R_w of lead wires connecting said duplicated electrodes to said device, and of the resistance R_s of said means for variable DC voltage delivery, a variable resistor means, means for adjusting said variable resistor to the ohmic value of said determined resistance R_p, a microammeter for measuring polarizing current i_p, a fixed resistor of ohmic value equal to the DC resistance of said microammeter, and connected in series with said variable resistor, two resistors of equal ohmic value connected in series and connected at one end to the one end of said series connection of said variable resistor and said fixed resistor, a second means for variable DC voltage delivery connected across said two equal resistors, voltage sensing means connectable across said series connection of said variable resistor and said fixed resistor and the one of said two equal resistors that is connected to one end of said series connection, a voltage nulling means operating through said voltage sensing means to adjust said second means for variable DC voltage delivery to maintain zero voltage input to said voltage sensing means, a low ohm resistor with one end connected to the other end of said series connection of said two resistors of equal ohmic value, a DC voltage supply connectable across said low ohm resistor for applying across said resistor a selected value of polarizing voltage e_p of polarity adding to that of said second means for variable DC voltage delivery, a connection of said microammeter to the other end of said low ohm resistor, in polarity to measure DC current i_p flowed by said polarizing voltage e_p, the connection across the input terminals of said double-pole-double-throw switch of the series connection of said variable resistor, of said fixed resistor, of the series connection of said two resistors of equal ohmic value, of said low ohm resistor, and of said microammeter, switch means for turning on and off said DC voltage supply connectable across said low ohm resistor, two isolation resistors, two cathodic terminals each connected to a first end of said isolation resistors and for connection to said two duplicated electrodes, a source of DC voltage, means for variable voltage delivery connected across said source of DC voltage, a DC current indicating device connected in series with a lead from said means for variable voltage delivery, an anode terminal connected to the positive lead from said means for variable voltage delivery and for connection to said third electrode, a ratio resistor connected in series with a second end of said two isolation resistors, a connection from the negative lead of said means for variable voltage delivery to a contact arm traversable along the resistor element of said ratio resistor, and means to increase the voltage delivered from said means for variable voltage delivery at a substantially constant rate of voltage increase from zero to maximum within a time lapse range selectable from about 3 to 10 minutes by a source of motive power.

4,060,462

COLOR ANODIZING OF ALUMINUM

William P. Kampert, Lower Burrell, Pa., assignor to Aluminum Company of America, Pittsburgh, Pa.

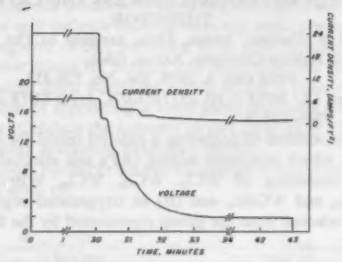
Filed Oct. 21, 1976, Ser. No. 734,613
Int. Cl.[2] C25D 11/14
U.S. Cl. 204—58 8 Claims

1. A process capable of producing a colored anodic coating on an aluminum alloy substrate comprising:

a. anodizing said aluminum in a sulfuric acid electrolyte at a

direct current voltage in the range of 6 to 24 volts to provide a conventional, substantially colorless coating thereon;

b. thereafter, reducing the voltage to a direct current voltage in the range of 0.5 to 3 volts while continuing to anodize said aluminum in the electrolyte; and



c. anodizing said aluminum alloy substrate at said voltage in the range of 0.5 to 3 volts for a period of time not greater than 15 minutes to produce the colored anodic coating by increasing the thickness of a barrier zone located intermediate the conventional coating and the aluminum alloy substrate.

4,060,463

OPERATION OF MERCURY-CATHODE CELLS

Denis Lee, and Alan David Cole Cantwell, both of Runcorn, England, assignors to Imperial Chemical Industries Limited, London, England

Filed Nov. 10, 1975, Ser. No. 630,688

Claims priority, application United Kingdom, Nov. 19, 1974, 50002/74

Int. Cl.² C25B *1/36, 9/00*

U.S. Cl. 204—99 **13 Claims**

1. In a method of operating a mercury cell comprising a circulating stream of fluid amalgam which passes through the cell as a flowing cathode, a pump and denuder and which includes at least one station at which the flowing amalgam enters a substantially static pool of amalgam covered by an aqueous phase at a velocity which causes a portion of the aqueous phase becomes dispersed in the amalgam, the improvement which reduces the amount of aqueous dispersion in the amalgam, said improvement comprising reducing the velocity of the amalgam just before the amalgam enters the substantially static pool.

4,060,464

METHOD FOR EXTRACTING AND RECOVERING IRON AND NICKEL IN METALLIC FORM

Per Anders Herman Henningsson Fahlström, Akers Runo; Thomas Konrad Miöen, Stockholm, and Gotthard E. Björling, Djursholm, all of Sweden, assignors to Boliden Aktiebolag, Stockholm, Sweden

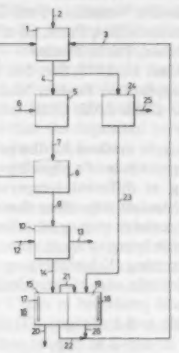
Continuation of Ser. No. 585,669, June 10, 1975, abandoned. This application July 19, 1976, Ser. No. 706,485

Claims priority, application Sweden, June 26, 1974, 7408394

Int. Cl.² C25C *1/06, 1/08, 1/24*

U.S. Cl. 204—113 **17 Claims**

1. A method of extracting and recovering the iron and nickel content of sulphidic iron-nickel-materials in the form of an alloy comprising at least 15% by weight nickel comprising the steps of leaching the material with an acidic solution containing an oxidizing agent comprising trivalent iron, so that substantially the whole quantity of said oxidizing agent is consumed; leading a part of the leaching liquid obtained to the anode chamber of an electrolytic cell, which comprises separate cathode and anode chambers; regenerating in said anode chamber said oxidizing agent for re-use in the leaching step; leading the remaining part of said leaching liquid having a nickel/iron ratio of at least about 1:2 to the cathode chamber; co-electrodepositing the iron and nickel content in said leaching liquid on the cathode in said cathode chamber; separating the iron - nickel deposit obtained from said leaching liquid and returning said leaching liquid to the leaching step.



4,060,465

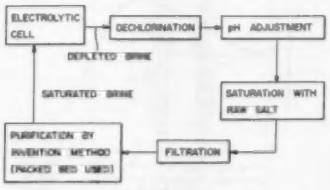
METHOD OF PURIFYING THE RAW BRINE USED IN ALKALI SALT ELECTROLYSIS

Noriyuki Yokota, Ashiya; Shingo Tokuda, Nishinomiya; Yoshiro Ito, and Kenji Itaya, both of Amagasaki, all of Japan, assignors to Osaka Soda Co. Ltd., Osaka, Japan

Continuation of Ser. No. 482,496, June 24, 1974, abandoned. This application Dec. 10, 1975, Ser. No. 639,409

Int. Cl.² C25B *1/00, 1/26*

U.S. Cl. 204—128 **7 Claims**



4. A method for the electrolysis of aqueous NaCl or KCl brine solution for the production of chlorine which comprises passing the brine solution through an electrolytic cell, passing an electric current through the cell and brine solution, passing the depleted brine solution to a dechlorination step to remove chlorine therefrom, adjusting the pH of the depleted brine solution to 3 to 10, saturating the depleted brine solution with raw salt containing Mg and Ca, filtering the saturated brine solution to remove undissolved solids, flowing the filtered brine solution at a pH of 3 to 10 and a space velocity of 2 to 20 hr^{-1} through a bed containing a member selected from the group consisting of a solid granular chelate-forming water-insoluble resins capable of forming an intramolecular complex with the Mg and Ca ions, said resins being selected from the group consisting of the styrene-butadiene copolymer resins containing the group $>N—CH_2COOH$, the epichlorohydrin polymer resins containing the group $>N—CH_2COOH$, and the N-phenyl glycine-glycidyl methacrylate copolymer resins containing the group $>N—CH_2COOH$ to selectively remove and substantially reduce the Mg and Ca concentration and recycling the saturated brine solution reduced in Mg and Ca to the electrolytic cell.

V 9 6 4 / 5 N 0 2 9 7 7 UMI

4,060,466
PROCESS FOR PREPARING HYDROGEN FROM WATER

Jean Marius Mascarello, Versailles; Paul Godin, Louveciennes, and Jacques Francois Millet, Paris, all of France, assignors to Electricite De France, Paris, France

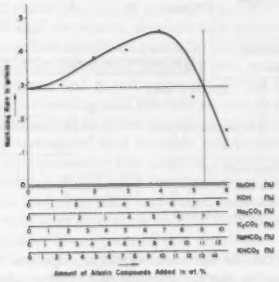
Filed Mar. 14, 1975, Ser. No. 558,299
Claims priority, application France, Mar. 29, 1974, 74.11466
Int. Cl.[2] C25B *1/02;* C01B *1/02, 1/26*
U.S. Cl. 204—129 5 Claims

1. In the closed cycle method for the preparation of hydrogen by an endothermic cycle of a plurality of successive chemical steps occurring at different temperatures in which the products of each chemical step other than hydrogen and oxygen are used in a successive step or recycled to a prior step, the net effect of said cycle being to break down water to its constituent elements, comprising (1) hydrolyzing magnesium chloride to magnesium hydroxide and hydrochloric acid, (2) reacting the hydrochloric acid produced in step 1 with copper to produce cupric chloride and hydrogen, (3) dismuting the cupric chloride produced in step 2 to copper and chlorine and recycling the copper thus produced to step 2, and (4) reacting the chlorine produced in step 3 with the magnesium hydroxide produced in step 1 to produce magnesium chloride, hydrogen and oxygen and recycling the magnesium chloride thus produced to step 1, the improvement which comprises effecting the dismuting of the cupric chloride electrochemically.

4,060,467
ELECTROLYTIC MACHINING SYSTEM

Sachio Maeda, Machida; Nagoa Saito, Nagoya; Shinji Arai, Nagoya, and Yuichiro Haishi, Nagoya, all of Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Japan

Continuation-in-part of Ser. No. 104,467, Jan. 15, 1971, abandoned. This application Feb. 12, 1975, Ser. No. 549,438
Int. Cl.[2] C25F *3/02*
U.S. Cl. 204—129.75 13 Claims



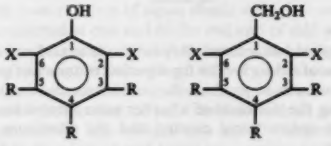
1. A method for electrolytically machining a workpiece consisting essentially of tungsten carbide alloy comprising the steps of: positioning a machining electrode opposite a surface portion of a workpiece consisting essentially of tungsten carbide alloy to form a small machining gap therebetween; flowing an aqueous electrolyte solution through said machining gap, said electrolyte solution consisting essentially of 5% to saturated value by weight of an alkali metal chloride selected from a group consisting of sodium chloride and potassium chloride, and an alkali metal compound selected from the group consisting of 3.6%–5.3% by weight of sodium hydroxide, up to 7.5% by weight of potassium hydroxide, up to 7.1% by weight of sodium carbonate, up to 9.2% by weight of potassium carbonate, up to 11.2% by weight sodium bicarbonate, and up to 13.3% by weight potassium bicarbonate; and passing an alternating electric current through said electrolyte solution in said machining gap, through said workpiece and through said machining electrode to render said workpiece anodic during part of the cycle of said alternating current to form oxides on the workpiece and to render said workpiece cathodic during the reverse part of the cycle of said alternating current to dissolve said oxides.

4,060,468
OLEFIN METATHESIS PROCESS AND CATALYST THEREFOR

Kenneth F. Castner, Akron, Ohio, assignor to The Goodyear Tire & Rubber Company, Akron, Ohio

Filed Oct. 4, 1976, Ser. No. 729,315
Int. Cl.[2] B01J *1/10, 23/16;* C07C *3/10;* C07F *2/46*
U.S. Cl. 204—158 R 8 Claims

1. The method of preparing a catalyst useful for olefin metathesis which comprises mixing (A) a salt selected from the group consisting of WCl_6, WCl_5, WCl_4, WBr_5, $WOCl_4$, WO_2Cl_2, and $WOBr_4$, and (B) an oxygenated organic compound selected from the group represented by the formula:



X is selected from Cl, Br, I, methyl, isopropyl or t-butyl group; R is selected from H, Cl, Br, I, alkyl, aryl, arylalkyl, alkaryl and cycloalkyl; and subsequently exposing said mixture of (A) and (B) to ultraviolet irradiation for at least long enough to give approximately 0.4 KWH per mole of the metal salt of tungsten.

4,060,469
PREPARATION OF 1,1,1-TRIFLUORO-2,2-DICHLOROETHANE

Richard F. Sweeney, Elma, N.Y., and James O. Peterson, Sylvania, Ohio, assignors to Allied Chemical Corporation, N.J.

Filed Dec. 21, 1976, Ser. No. 753,155
Int. Cl.[2] B01J *1/10*
U.S. Cl. 204—163 R 14 Claims

1. A process for the preparation of 1,1,1-trifluoro-2,2-dichloroethane, comprising photochlorinating 1,1,1-trifluoro-2-chloroethane in a reaction zone with a less than molar equivalent of chlorine in the presence of actinic radiation, and with a residence time in the chlorine/1,1,1-trifluoro-2-chloroethane reaction zone of such duration that essentially no unreacted chlorine is entrained in the reaction effluent, but of insufficient duration as to effect other than minimal by-production of perhalogenated contaminant.

4,060,470
SPUTTERING APPARATUS AND METHOD

Peter J. Clarke, 760 Arcady Road, Santa Barbara, Calif. 93108

Continuation-in-part of Ser. No. 530,069, Dec. 6, 1974, abandoned. This application Dec. 19, 1975, Ser. No. 642,455
Int. Cl.[2] C23C *15/00*
U.S. Cl. 204—192 R 26 Claims

1. Glow discharge sputtering apparatus for coating a work piece including:

anode and cathode electrode means for operation at independent operating electrical potentials to establish in use a main electric field intercepted by said cathode means;

said cathode electrode means adapted to contain a main portion made of a material to be sputtered from said cathode means onto the work piece;

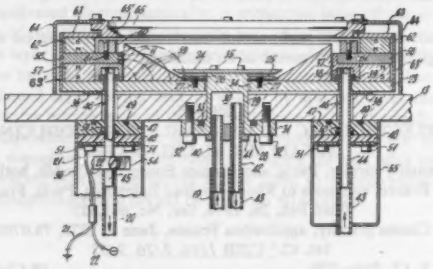
magnet means including a main magnetic circuit for producing a main magnetic field passing out of and looping back into said main cathode portion and a stray magnetic field not intercepted by said main cathode portion and said

main magnetic field being crossed with said electric field over said main cathode portion;

means for applying an operating electrical potential between said anode and cathode means for establishing in operation a main magnetically enhanced glow discharge over said main cathode portion for bombarding said main portion of said cathode means with positive ions to produce sputtering of said cathode material onto the work piece; and

said magnetic circuit including stray glow discharge suppression means for shaping said stray magnetic field lines in a stray glow discharge region which is otherwise susceptible of supporting a stray glow discharge therein in order to reduce the intensity of said stray glow discharge and stray sputtering generated thereby.

9. In a glow discharge sputtering method for coating a work piece, the steps of:



producing crossed magnetic and electric fields over the main surface of a cathode electrode made of a material to be sputtered onto the work piece, such produced magnetic field having a stray magnetic field component disposed over portions of the cathode electrode structure from which sputtering is to be suppressed;

suppressing the stray sputtering of the cathode electrode structure by shaping the stray magnetic field in the region of the stray glow discharge region so as to substantially reduce the intensity of the stray magnetic field component at right angles to the electric field component in the region of the stray glow discharge, whereby such stray glow discharge is substantially suppressed thereby suppressing undesired cathode sputtering resulting therefrom.

4,060,471

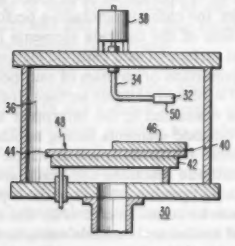
COMPOSITE SPUTTERING METHOD

Harry Louis Pinch, Princeton, N.J., and Herbert Irwin Moss, Yardley, Pa., assignors to RCA Corporation, New York, N.Y.

Division of Ser. No. 578,899, May 19, 1975, Pat. No. 4,013,830. This application Sept. 17, 1976, Ser. No. 724,220

Int. Cl.[2] C23C *15/00*

U.S. Cl. 204—192 SP **7 Claims**



1. A method for sputtering a layer in which the concentration of the component materials varies through the thickness of the layer, said method comprising the steps of:

moving the substrate within a sputtering apparatus having sources of the different component materials, the substrate being moved during the deposition from a position where the deposition is substantially from a first source to at least one intermediate position where deposition is from said first source and at least another of said sources to a position where deposition is substantially from said another of said sources, so that the deposited layer varies in concentration through its thickness.

6. A method for making a video disc stylus comprising the steps of:

placing a substrate formed of a dielectric material into the chamber of a radio frequency diode sputtering apparatus, the chamber containing a composite sputtering target having a section of the same conductive material and a section of dielectric material which comprises the substrate;

activating the sputtering apparatus causing the materials of the sputtering target to sputter; and

moving the substrate across the surface of the composite sputtering target from an initial position near the section of dielectric material to a position near the section of conductive material so that the sputtered material strikes and adheres to the substrate.

4,060,472

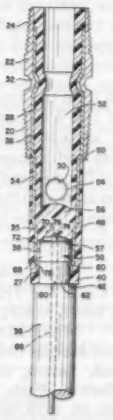
ANODE-FITTING ASSEMBLY

Sam Alewitz, Painesville, Ohio, assignor to Perfection Corporation, Madison, Ohio

Continuation-in-part of Ser. No. 310,561, Nov. 29, 1972, Pat. No. 3,891,530. This application June 24, 1975, Ser. No. 589,865 The portion of the term of this patent subsequent to June 24, 1992, has been disclaimed.

Int. Cl.[2] C23F *13/00*

U.S. Cl. 204—197 **8 Claims**



1. An anode-fitting assembly for a water heater or the like comprising in combination:

a fitting member adapted to be secured to the wall of such water heater in electrical contact therewith, said fitting member having an interior cylindrical wall defining a recess at one end thereof;

an anode member comprising:

an electrode;

a joining member received about one end of said electrode;

locking recess means defined in said anode member;

said joining member and said one end of said electrode being disposed in said recess of said fitting member;

said joining member having a cylindrical portion the inner wall of which is in physical and electrical contact with the exterior surface of said electrode and the exterior wall of which is in physical and electrical contact with at least a portion of said interior cylindrical wall defining said recess of said fitting member, said cylindrical portion being entirely received within said recess of said fitting member and, in a radial direction, being located between said electrode and said fitting member providing an electrical interconnection between said electrode and said fitting member;

said fitting member having a locking portion disposed essentially adjacent said locking recess means of said anode member, a part of said locking portion being disposed in said locking recess means thus to provide for locking of said anode member to said fitting member.

4,060,473

NOVEL COPOLYMERS AND DIAPHRAGMS MADE THEREFROM

Luigi Giuffre, Milan, Italy; Vittorio de Nora, Nassau, Bahamas, and Placido Spaziante, Milan, Italy, assignors to Oronzio de Nora Impianti Elettrochimici S.p.A., Milan, Italy

Filed Nov. 14, 1975, Ser. No. 632,056

Claims priority, application Italy, Mar. 28, 1975, 21810/75

Int. Cl.² C25B *1/16, 1/26, 9/00*

U.S. Cl. 204—253 **19 Claims**

1. A diaphragm for an electrolysis cell comprising a film made of water-wettable and water-insoluble at least 60% sulfonated copolymer of (A) a monomer of the formula

$$Y-CH=CH-X$$

wherein X is an electron attracting group and Y is selected from the group consisting of hydrogen, methyl and ethyl and (B) a halogenated monomer of the formula

$$R-\underset{\displaystyle Y'}{\overset{\displaystyle Y''}{C=C}}-Y'''$$

wherein R is selected from the group consisting of hydrogen, halogen and alkyl of 1 to 4 carbon atoms optionally halogenated, Y', Y'' and Y''' are individually selected from the group consisting of hydrogen and halogen with the proviso that at least one of the Y's is fluorine and the sulfonic acid group is attached to the carbon atom α to the electron attracting group, the ratio of B to A being 1:2.5 to 1:42.

4,060,474

ELECTROLYTIC CELL OF THE DIAPHRAGM TYPE COMPRISING A BASE MADE OF AN INSULATING MATERIAL

Daniel Masure, Lavera; Jacques Guillaumont, Saint-Auban, and Jean-Marie Pigeaud, Lavera, all of France, assignors to Rhone-Poulenc Industries, Paris, France

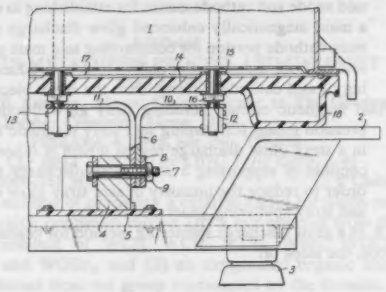
Filed Feb. 26, 1976, Ser. No. 661,531

Claims priority, application France, Feb. 26, 1975, 75.05963

Int. Cl.² C25B *1/16, 1/26, 9/02*

U.S. Cl. 204—270 **3 Claims**

1. An electrolytic cell of the diaphragm type, comprising, in combination, a base of an electrically insulating material, a plurality of anodes fixed on said base of said cell by means of extensions of said anodes which pass through said base, said extensions comprising at least one core of a metal which is a good electrical conductor, connecting means connected to at least one of a plurality of current distributing bars, and a rigid structure with the distributing bar and the base of the cell resting thereon, said distributing bars being disposed between said base of said cell and said rigid structure, said plurality of current distribution bars being extended by a platform located in front of said cell, from which electrical connection between cells is provided, said rigid structure resting on supports and



with at least one said current distributing bar resting on said rigid structure by means of an insulating element.

4,060,475

ELECTROLYTIC CELL SUITABLE FOR PRODUCING ALKALI METAL CHLORATES

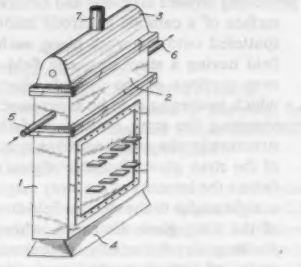
Daniel Fournier, Paris, and Hugues Bourgeois, Chedde, both of France, assignors to Rhone-Poulenc Industries, Paris, France

Filed Feb. 26, 1976, Ser. No. 661,527

Claims priority, application France, June 3, 1975, 75.07008

Int. Cl.² C25B *1/16, 1/26, 9/02*

U.S. Cl. 204—270 **19 Claims**



1. An electrolytic cell, without a diaghragm, wherein products resulting from the anode and cathode reactions react together inside the cell, suitable for use in obtaining alkali chlorates from alkali chlorides, said electrolytic cell comprising an anode block and a cathode block, each block including a set of parallel electrodes arranged so that the anodes of said anode block are accommodated in the space defined between two cathode surfaces of the cathodes of said cathode block, the interpolar space being kept constant, wherein said anodes and cathodes are mounted on substantially vertical anode and cathode ends so as to provide an open space above the anode and cathode units; the cathodes including perforated elements; at least one surface of the cathode elements facing an anode surface with said surface of said cathode elements being perforated and the proportion of cavities of said perforations being at least about 10% of said cathode surface; thereby permitting exit of the gases contained in the interpolar space; the other surface of said cathode elements facing another cathode surface, so as to define a cathode space in which the products of the anode and cathode reactions can react; and the said cathodes also containing openings at least at the top, so as to permit the cathode space to communicate with the open space provided above said anodes and cathode units, and so as to permit exit of the gaseous substances contained in the cathode space; said interpolar distance being from about 2 to 4 millimeters,

and the width of said cathode space being from about 4 to 12 centimeters.

4,060,476

ANODE FOR ELECTROCHEMICAL PROCESSES

Wolfram Treptow, Ludwigshafen, and Gerd Wunsch, Speyer, both of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen (Rhine), Germany

Filed Dec. 15, 1975, Ser. No. 640,575
Claims priority, application Germany, Dec. 30, 1974, 2461800
Int. Cl.[2] C25B *11/04, 11/16*
U.S. Cl. 204—290 F 7 Claims

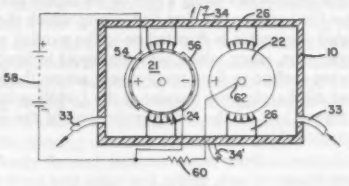
1. An anode suitable for use in electrochemical process and comprising an electrode base plate made of a metal which can be passivated electrochemically, a protective layer of the nitride of the metal of the electrode base plate applied thereto, and a layer containing manganese dioxide as electrochemically active material and overlying the protective layer, said last-mentioned layer having been produced by applying over the protective nitride layer of the electrode base plate a thermally decomposable manganese salt and decomposing said salt to form manganese dioxide by rapidly bringing the salt, after its application over the protective nitride layer, to its decomposition temperature in a period of less than 60 seconds.

4,060,477

APPARATUS FOR REMOVING IONS FROM AN IONIZED LIQUID

Philip E. Benner, 1739 Randolph Road, Schenectady, N.Y. 12308

Filed Jan. 3, 1977, Ser. No. 756,199
Int. Cl.[2] C02B *1/14*
U.S. Cl. 204—300 R 13 Claims



1. In a system for removing ions from an ionized liquid of the type employing a pair of adjacent rotating bi-polar electrodes having peripheral surfaces of selective ion adsorption material disposed in the ionized liquid and wherein electrically induced ion-adsorption takes place in one portion of the liquid, said ions are transported out of said one portion of the liquid by the rotation of the electrodes and rejected into another portion of the liquid, the improvement comprising:

a. At least one segmented rotating electrode; and

b. Brush contact means operatively associated with said segmented electrode and a direct current voltage source for applying one polarity voltage to a plurality of segments on one side of said segmented electrode and the opposite polarity voltage to a similar plurality of segments on the opposite side of said segmented electrode and establish a voltage polarity difference between the two sides of said segmented electrode to effect ion-adsorption from one portion of the ionized liquid and ion-rejection to another portion of the ionized liquid.

4,060,478

COAL LIQUEFACTION BOTTOMS CONVERSION BY COKING AND GASIFICATION

Robert J. Lang, Baytown, Tex., assignor to Exxon Research and Engineering Company, Linden, N.J.

Filed Sept. 30, 1976, Ser. No. 728,335
Int. Cl.[2] C10G *1/04;* C01B *1/18*
U.S. Cl. 208—8 19 Claims

1. A process for upgrading heavy bottoms produced by the liquefaction of coal or similar carbonaceous solids which comprises pyrolyzing said bottoms in the presence of an added alkaline earth metal compound to produce coke containing added alkaline earth metal constituents and thereafter gasifying said coke in the presence of steam.

4,060,479

PROCESS FOR OBTAINING OIL, GAS, SULFUR AND OTHER PRODUCTS FROM OIL SHALE

Eduardo Da Costa Barcellos, Avenida Atlantica 290 Apt. 92, Rio de Janeiro, Brazil

Filed Oct. 20, 1975, Ser. No. 623,984
Claims priority, application Brazil, Oct. 21, 1974, 8744
Int. Cl.[2] C10G *1/02*
U.S. Cl. 208—11 R 15 Claims

1. A process for obtaining useful products from oil shale, comprising introducing crushed raw oil shale through the upper part of an essentially vertical processing vessel, causing said shale to move continuously downwardly as a moving bed, continuously introducing a gaseous mixture consisting essentially of oxygen and steam into the bottom of said moving bed, whereby an ascending gaseous stream continuously contacts said downwardly moving bed, said moving bed of shale passing, successively, through a drying and heating zone, a pyrolysis zone in which the temperature ranges from about 320° C. to about 700° C., a gasification zone in which the temperature ranges from about 760° C. up to the maximum bed temperature, a combustion zone and a cooling zone, withdrawing the spent shale from the bottom of the vessel, and withdrawing the resulting vapor, oil mist and gas product stream mixed with unreacted introduced steam from the upper portion of the processing vessel; said pyrolysis comprising converting the kerogen of the oil shale into essentially oil, gases and water vapor, leaving residual carbon, hydrogen and sulfur in the shale; said gasification comprising the reaction of steam with said residual carbon and sulfur in the shale to form H_2, CO, CO_2 and H_2S; said combustion comprising the burning of fuel matter remaining in the shale with the introduced oxygen, and serving as the source of heat required by the process, the temperature of the combustion zone being the maximum bed temperature, said temperature being controlled slightly lower than the clinkerization point of the spent shale, but being permitted to reach said clinkerization point occasionally, and the amount of steam employed being sufficient to assure such control of the maximum bed temperature and the presence of the gasification zone above the combustion zone.

4,060,480

HYDROCARBON HYDROCONVERSION PROCESS EMPLOYING HYDROXY-ALUMINUM STABILIZED CATALYSTS SUPPORTS

Marion G. Reed, Hacienda Heights, and Joseph Jaffe, Berkeley, both of Calif., assignors to Chevron Research Company, San Francisco, Calif.

Division of Ser. No. 177,819, Sept. 3, 1971, Pat. No. 3,798,177.
This application Nov. 26, 1973, Ser. No. 419,178
Int. Cl.[2] C10G *13/04, 23/02;* C01B *29/28;* C10G *27/08*
U.S. Cl. 208—111 12 Claims

1. In a hydrocarbon conversion process for the production of hydrocracked hydrocarbons by hydrocracking said hydrocarbon in a conversion catalyzed by a catalyst comprising a support and at least one hydrogenating component selected from the group consisting of Groups IV, V, VI, VII and VIII

of the Periodic Table, said support being a crystalline silica-alumina having a surface area within the range from about 50 to about 750 m^2 per gram selected from the group consisting of natural and synthetic clay-type minerals and zeolitic molecular sieves; and said conversion being effected under ordinary hydrocarbon hydroconversion conditions, the improvement which comprises carrying out said hydrocracking wherein said catalyst support is stabilized, said stabilization having been effected by treating said support with an aqueous hydroxy-aluminum solution having a ratio of hydroxyl groups to aluminum atoms in the range from about 1.5 to about 2.7.

4,060,481

MATERIAL TREATING APPARATUS INCLUDING PNEUMO-HYDRAULIC VIBRATOR

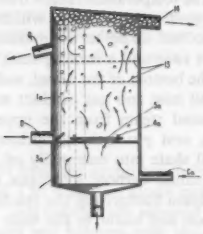
Stoycho Mitrev Stoev; Metodi Stoyanov Metodiev; Lyubomir Vladimirov Kuzev; Petko Georgiev Vedrichkov; Ivan Mitrev Sapunarov; Vassil Vladimirov Vassilev; Spas Petkov Dimitrov; Vihar Assenov Gasharov; Sheko Kolev Russev, and Kostadin Georgiev Mitrev, all of Sofia, Bulgaria, assignors to Vish Minno-Geoloshki Institute - NIS, Sofia, Bulgaria

Division of Ser. No. 572,457, April 28, 1975, abandoned. This application May 20, 1976, Ser. No. 688,267

Claims priority, application Bulgaria, Feb. 19, 1974, 25837

Int. Cl.² B03D *1/24*

U.S. Cl. 209—170 **1 Claim**



1. An apparatus for treating pulp in a liquid, such apparatus having a working cell with opposite vertical walls adapted to contain the liquid and pulp, the improvement which comprises a gas cell disposed at least partially below said working cell, first wall means disposed in said apparatus having at least one aperture separating said working cell and said gas cell, a valve disposed in said aperture and having a valve element disposed above the aperture and normally urged into a closed position by the weight of the liquid, a source of pressurized gas, first conduit means adapted to place said source of pressurized gas in fluid communication with said gas cell, valve means operatively mounted in said first conduit means between said source of pressurized gas and said gas cell and adapted to regulate the pressurized gas flow to said gas cell, the pressurized gas in said gas cell producing intermittently sufficient force to move said valve element upwardly and permit the escape of gas into said working cell and thereby causes a vibration of said valve element, means for guiding the valve element for vertical travel with respect to at least a portion of said wall means, a pair of vertically spaced horizontal grids spanning between said opposite vertical walls of said working cell and being supported by them, and at least two discharge conduit means disposed in one of said vertical walls of said working cell above the uppermost horizontal grid for discharging a froth product from said working cell.

4,060,482

METHOD OF AND APPARATUS FOR SEPARATING FRACTIONS OF DIFFERENT DENSITY CONTAINED IN ORES OR OTHER SOLID MATERIALS

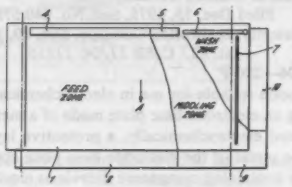
Richard Owen Burt, Camborne, England, assignor to Bartles (Carn Brea) Limited, United Kingdom

Filed Oct. 15, 1975, Ser. No. 622,722

Claims priority, application United Kingdom, Oct. 18, 1974, 45230/74

Int. Cl.² B03B *5/08*

U.S. Cl. 209—432 **25 Claims**



1. A method of separating fractions of different densities contained in solid material which comprises directing the solid material in a liquid suspension on to a surface of an endless belt moving in the direction of its length and, inclined transversely to its direction of motion, along a first part of the length of a higher portion of the belt and subjecting said moving surface of the belt to a shaking motion so that lighter fractions are separated from the material and flow off a lower side edge of the belt into a receptacle; directing washing liquid on to said moving surface from another part of the length of said higher portion of the belt that is downstream of said first part so that the washing liquid flows transversely across said shaking, moving surface to separate middling fractions from the material and carry them off the lower side edge of the belt into a second receptacle; discharging heavier fractions of the material that remain on said shaking, moving surface over the downstream end of said moving surface of the endless belt into a third receptacle; retreating the middling fractions collected in the second receptacle by redirecting them on to the moving surface of the endless belt along a part of the higher portion of the belt that lies between the first part, along which the material in a liquid suspension is directed on to the moving surface, and the other part, along which washing liquid is directed on to the moving surface to flow transversely across the moving surface; and discharging the heavier of the middling fractions over the higher part of the downstream end of the moving surface into said third receptacle.

4,060,483

METHOD AND APPARATUS FOR EFFECTING THE CLEANING OF A FLUID FILTER

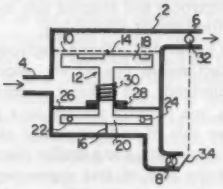
Ytzhak Barzuza, 1 Mevo Bosmat Str.Gilo, Jerusalem, Israel

Filed May 5, 1976, Ser. No. 683,487

Claims priority, application Israel, May 14, 1975, 47305

Int. Cl.² B08B *9/04*

U.S. Cl. 210—79 **15 Claims**



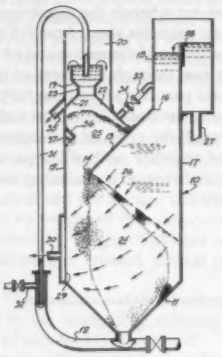
1. A method for effecting the cleaning of a clogged fluid

filtering member in a filtering system situated between an inlet and an outlet port comprising utilizing at least a portion of the fluid to be filtered in said system to impart motion to a movable hollow cleaning body provided therein in fluid communication with a valved cleaning outlet and to carry matter unable to pass through said filtering member into a fluid intake portion of said cleaning body and out said cleaning outlet, said hollow body is imparted said motion by virtue of the fluid flow in the path established through said hollow body between said fluid intake portion and said cleaning outlet when the normally closed valved cleaning outlet is opened.

4,060,484
FILTERS

Eric Paul Austin, Sandbach, and John Trevor Allanson, Alsager, both of England, assignors to Simon-Hartley Limited, Stockport, England

Continuation of Ser. No. 488,819, July 15, 1974, abandoned.
This application Dec. 19, 1975, Ser. No. 642,313
Claims priority, application United Kingdom, Aug. 25, 1973, 40368
Int. Cl.² B01D *23/16*
U.S. Cl. 210—80 **9 Claims**



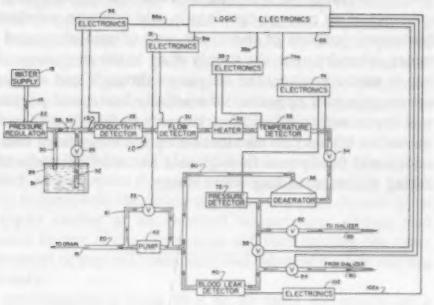
1. A method of filtering a liquid comprising the steps of providing a bed of particulate material comprising particles of varying sizes and contained within a vessel, continually withdrawing material from the base of the bed, continually supplying replacement particulate material to the bed through an opening having an edge forming a boundary to said opening and past which the material flows, the vessel extending beneath the opening on either side of said edge whereby the bed has a freely formed inclined upper surface extending downwardly from said edge and where due to classification as the particles move down said surface an outer layer of predominately larger particles is formed over an inner layer or layers of predominately smaller particles beneath said outer layer, and causing the liquid to be filtered to enter the vessel through a duct separate from said opening for flow downwardly through the bed, the liquid entering the bed substantially only through said inclined upper surface for initial flow through said outer layer.

4,060,485
DIALYSIS APPARATUS

Thomas Eaton, Hawthorne, Calif., assignor to I T L Technology, Inc., Hawthorne, Calif.

Filed June 9, 1975, Ser. No. 585,074
Int. Cl.² B01D *31/00, 13/00*
U.S. Cl. 210—87 **9 Claims**

1. A dialysis apparatus comprising:
an elongated flow passage having a water inlet at one end and a fluid discharge at the other end;
a reservoir containing a brine concentrate said reservoir communicating with portions of said passage downstream of said water inlet so that water enters said reservoir to force said brine concentrate out of said reservoir and into said passage;
a water inlet tube connected between said passage and said reservoir and in direct communication with said brine concentrate in said reservoir;
a brine outlet tube connected to said reservoir and to said passage downstream of said water inlet tube;
a restrictor means in said passage between said water inlet tube and said brine outlet tube for permitting water to flow therethrough at a pressure lower than the water pressure applied to said water inlet tube whereby said brine concentrate entering said passage from said brine outlet tube will be diluted by the water passing through said restrictor means to form a brine solution;

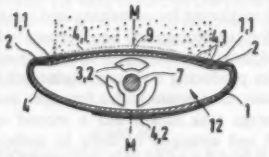


a conductivity detector means in said passage downstream of said brine outlet tube for detecting changes in the conductivity of said brine solution;
valve means in said brine outlet tube operable by said conductivity detector means for controlling flow of said brine concentrate through said brine outlet tube;
spaced inlet and outlet tubes connected to said passage downstream from said conductivity detector means for connecting a blood dialyzer device to said passage; and
a pump downstream of said dialyzer device having an inlet connected to said passage for drawing said brine solution through said dialyzer and an outlet for discharging said brine solution to a drain.

4,060,486
WASTE WATER AERATION DEVICE

August Schreiber, Bahnhofstr. 45, 3001 Hannover-Vinnhorst, Germany

Filed Mar. 25, 1976, Ser. No. 670,223
Claims priority, application Germany, Mar. 26, 1975, 2513547
Int. Cl.² C02C *1/12;* B01F *3/04*
U.S. Cl. 210—220 **7 Claims**



1. A device for the intermittent aeration of waste water which comprises an elongated air supply container, said container consisting of connected upper and lower outwardly arched walls enclosing an air passage chamber therebetween, said upper wall consisting of an outwardly arched central portion and opposite, substantially horizontal portions adjacent the two longitudinal edges thereof in the elongated direction of said air supply container, said lower arched wall being

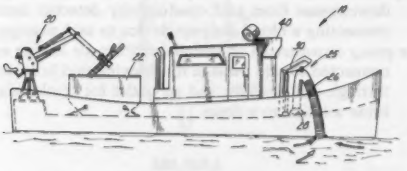
connected to the opposite, substantially horizontal portions of said upper wall, means forming a plurality of air passage openings in said opposite, substantially horizontal portions of said upper wall, means closing the opposite ends of said elongated air supply container, means for intermittently supplying air to the air passage chamber in said elongated air supply container; a flexible air distribution casing stretched over said upper wall of said air passage chamber so as to cover said outwardly arched central portion of said upper wall in an air-tight fashion but retain respective free air spaces between said opposite, substantially horizontal portions of said upper wall and said flexible air distribution casing, means forming air outlet openings in said air distribution casing, said air outlet openings being positioned in said casing adjacent said arched central portion of said upper wall and between said opposite longitudinal rows of air passage openings in said opposite, substantially horizontal portions of the upper wall of said elongated container, whereby upon the supply of air to the air passage chamber in said container, the air passes through said air passage openings in said opposite, substantially horizontal portions of said upper wall to fill said free air spaces with no resistance and thereafter lift said air distribution casing away from said container, and finally pass through said air outlet openings of said casing into surrounding waste water.

4,060,487

APPARATUS FOR CLEANING OIL SPILLS

Frank J. Samsel, 13455 Lake Ave., Lakewood, Ohio 44107

Filed Dec. 17, 1973, Ser. No. 425,324
Int. Cl.² E02B *15/04*
U.S. Cl. 210—242 R **4 Claims**



1. An integrated system for collecting and transferring to land for disposal thereon liquid and solid waste floating on or near the surface of a body of water, said system comprising, in combination:

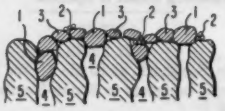
a floating vessel with a hull and a deck, crane means with controls therefor mounted on the deck of said vessel and positioned for removing large solids from said body of water, container means removably installed on said deck adjacent said crane for containing said solids, storage tank means for the storage of liquid waste which has been removed from the surface of said body of water, pump means for producing a vacuum connected to said storage tank means, hose means with a first open end connected to said storage tank means and a second open end constructed and arranged to draw in surface liquid while spaced above the surface of said body of water, support means for supporting the second open end of said hose spaced above the surface of said body of water, pump means connected to said storage tank for removing the contents thereof, and shore based means including a truck for removing containers filled with solid waste from the deck of said vessel when at a dock, whereby said containers may be transported by said truck for the disposal of said solid waste on land.

4,060,488

PARTICULATE MEMBRANE ULTRAFILTRATION DEVICE

Fred Wayne Hoover, and Ralph K. Iler, both of Wilmington, Del., assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Nov. 20, 1975, Ser. No. 633,835
Int. Cl.² B01D *31/00*
U.S. Cl. 210—433 M **8 Claims**



1. In an ultrafiltration device of the type comprising an integral porous support having pores about from 0.5 to 45 microns in their smallest cross sectional dimension and a removable and renewable particulate membrane inert to feedstock coated onto at least a portion of the surface of the support, the improvement wherein the membrane comprises

a. large inorganic particles about from 0.5 to 45 microns in average cross sectional dimension and of such size as will enter but not pass through the pores of the support and

b. small inorganic particles about from 0.002 to 0.5 microns in average cross sectional dimension and of such size as will pass through the pores of the support, said particles being bonded together with silica particles formed by heating the membrane with an alkaline solution of silica at about 90°–100° C.

4,060,489

FIRE FIGHTING WITH THIXOTROPIC FOAM

Peter J. Chiesa, Jr., Coatesville, Pa., assignor to Philadelphia Suburban Corporation, Bryn Mawr, Pa.

Continuation-in-part of Ser. No. 557,757, March 12, 1975, and a continuation-in-part of Ser. No. 525,175, Nov. 19, 1974, and a continuation-in-part of Ser. No. 369,584, June 13, 1973, Pat. No. 3,957,657, said Ser. No. 557,757, is a continuation-in-part of Ser. No. 307,479, Nov. 17, 1972, abandoned, said Ser. No. 525,175, is a continuation-in-part of Ser. No. 307,479, , said Ser. No. 369,584, is a continuation-in-part of Ser. No. 307,479, , which is a continuation-in-part of Ser. No. 254,404, May 18, 1972, Pat. No. 3,849,315, which is a continuation-in-part of Ser. No. 131,763, April 6, 1971, abandoned. This application Mar. 25, 1976, Ser. No. 670,252
Int. Cl.² A62D *1/00*
U.S. Cl. 252—3 **17 Claims**

1. An aqueous pumpable fire-fighting concentrate for dilution with at least about ten times its volume of water and foaming with air to produce a fire-fighting foam, said concentrate containing (a) a foaming agent that causes the diluted concentrate to form a foam having an expansion of at least about 3, and (b) a water-soluble thixotropic polysaccharide dissolved in an amount that causes the foam to undergo syneresis and form a floating gel mat when applied to a non-aqueous polar solvent.

6. The concentrate of claim 1 which also contains film-forming material in an amount that causes the foam to form an aqueous film over a liquid hydrocarbon to which the foam is applied.

4,060,490

COMPOSITION AND METHOD FOR ENHANCED OIL RECOVERY UTILIZING AQUEOUS POLYACRYLAMIDE SOLUTIONS

George G. Bernard, La Mirada, Calif., assignor to Union Oil Company of California, Brea, Calif.

Filed Aug. 23, 1976, Ser. No. 716,887
Int. Cl.[2] E21B *43/22*
U.S. Cl. 252—8.55 D 10 Claims

1. A displacement fluid composition for enhanced recovery of liquid hydrocarbons from a subterranean reservoir comprising an aqueous solution comprising:

a. about 0.005 to about 1.5 percent by weight of a polymer thickener having a molecular weight above about 0.2×10^6 selected from the group consisting of polyacrylamide, partially hydrolyzed polyacrylamide and copolymers of acrylic acid and acrylamide;

b. about 1 to about 10 percent by weight of a liquid detergent consisting essentially of:

1. 25–40 percent by weight of a sulfated and neutralized reaction product obtained from (i) condensing 1–5 moles of ethylene oxide and 1 mole of monohydric alcohol of from 10–16 carbon atoms in the molecule, (ii) sulfating the condensation product of (i), (iii) neutralizing the sulfated product of (ii) with a neutralizing agent selected from the group consisting of ammonia and alkylol-substituted ammonia having from 2–3 carbon atoms in the alkylol group;

2. an organic builder substance consisting essentially of alkylol amide of saturated fatty acids having 10, 12 and 14 carbon atoms and an alkylol amine, said alkylol amide having not more than 3 carbon atoms in each alkylol radical and the amount thereof being from 6 to 12 percent by weight of the composition;

3. 15–25 percent by weight of alcohol selected from the group consisting of ethanol, normal propanol and isopropanol;

4. not over 5 percent by weight of extraneous substances produced by the condensing, sulfating and neutralizing reactions of step (b) (1) above; and

5. water to make 100 percent by weight; and

c. aqueous media selected from the group consisting of fresh water and brine to make 100 percent by weight.

4,060,491

LUBRICANT COMPOSITION

Robert F. Bridger, and Kirk D. Schmitt, both of Hopewell, N.J., assignors to Mobil Oil Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 619,098, Oct. 2, 1975, abandoned. This application May 26, 1976, Ser. No. 690,219
Int. Cl.[2] C10M *1/32, 3/26, 5/20, 7/30*
U.S. Cl. 252—50 11 Claims

1. A method for reducing wear between moving steel-on-steel surfaces which comprises introducing between said surfaces a lubricant composition comprising an oil of lubricating viscosity or a grease prepared therefrom containing an antiwear amount of a 5-alkylbenzotriazole wherein the alkyl group contains from 4 to 16 carbon atoms.

4,060,492

SYNTHETIC SATURATED OILS, AND THEIR PRODUCTION AND USE

Seimei Yasui, Takarazuka, and Hiroshi Sato, Toyonaka, both of Japan, assignors to Sumitomo Chemical Company, Limited, Japan

Filed May 25, 1976, Ser. No. 689,689
Claims priority, application Japan, May 26, 1975, 50-63266
Int. Cl.[2] C10M *1/18*
U.S. Cl. 252—59 11 Claims

1. A method for the preparation of synthetic saturated oils, which comprises hydrogenation of low molecular weight polyisoprene having the 1,4 structure of at least 70% of the main chains and a number average molecular weight of about 150 to 3,000.

2. The method according to claim 1, wherein the hydrogenation is carried out by treatment with hydrogen in the presence of a hydrogenation catalyst.

4,060,493

LIQUID ELECTROSTATIC DEVELOPER

Kazuo Tsubuko, Yokohama; Taro Kimura, Tokyo; Junichiro Hashimoto, Tokyo, and Tsuneo Kurotori, Tokyo, all of Japan, assignors to Ricoh Co., Ltd., Tokyo, Japan

Filed July 10, 1975, Ser. No. 594,806
Int. Cl.[2] G03G *9/12*
U.S. Cl. 252—62.1 L 4 Claims

1. A liquid electrostatic developer consisting essentially of pigment or dyestuff blended in a non-aqueous dispersion of a graft copolymer and from one to 50 parts by weight, per 100 parts by weight of said graft copolymer, of at least one substance selected from the group consisting of polyethylene, polyethylene wax and paraffin wax having a softening point of 60° C to 130° C, said graft copolymer and said substance being dispersed in an organic liquid carrier having a high resistivity of more than $10^9\Omega$.cm and a low dielectric constant of less than 3, which non-aqueous dispersion has been prepared by carrying out successively the following three steps (a), (b) and (c) in said liquid carrier at an elevated temperature, adding said substance in one of the three steps and then cooling the reaction product of step (c) containing said substance while stirring vigorously:

a. copolymerizing from 99.9 to 80 parts by weight of a monomer having the formula (I):

(I)

, wherein R is hydrogen of methyl, A is $-COOC_nH_{2n+1}$ or $-OC_nH_{2n+1}$, and n is an integer of 6 to 20, with from 0.1 to 20 parts by weight of at least one compound selected from the group consisting of acrylic acid, methacrylic acid, fumaric acid, crotonic acid, itaconic acid, maleic acid, glycidyl acrylate and glycidyl methacrylate,

b. esterifying 100 parts by weight of the copolymer obtained in step (a) with from 0.1 to 20 parts by weight of glycidyl acrylate or glycidyl methacrylate when said copolymer has been prepared by using acrylic acid, methacrylic acid, fumaric acid, crotonic acid, itaconic acid or maleic acid, or esterifying 100 parts by weight of the copolymer obtained in step (a) with from 0.1 to 20 parts by weight of acrylic acid, methacrylic acid, fumaric acid, crotonic acid, itaconic acid or maleic acid when said copolymer has been prepared by using glycidyl acrylate or glycidyl methacrylate, and then

c. grafting 100 parts by weight of the esterified copolymer obtained in step (b) with from 5 to 100 parts by weight of a monomer having a vinyl group selected from the group consisting of acrylic acid, methacrylic acid, a lower alkyl ester of acrylic acid or methacrylic acid, styrene, methylstyrene and vinyl acetate.

4,060,494

NON-CAUSTIC DRAIN CLEANER

Daniel Schoenholz, Basking Ridge, and Arthur W. Petersen, Chatham Township, Morris County, both of N.J., assignors to Foster D. Snell, Inc., Florham Park, N.J.

Filed June 12, 1975, Ser. No. 586,188
Int. Cl.[2] C11D *7/54*
U.S. Cl. 252—105 5 Claims

1. A method of unclogging clogged drains comprising contacting a clog in a clogged drain with an amount sufficient to soften and loosen the clog by generated heat of approximately

stochiometric amounts of an inorganic per oxygen oxidizing agent and a water-soluble reducing agent.

4,060,495

HYDROXYARYLDIALKYL SULFONIUM HALIDES

Vincent Lamberti, Upper Saddle River, and Mark D. Konort, Haworth, both of N.J., assignors to Lever Brothers Company, New York, N.Y.

Division of Ser. No. 114,034, Feb. 9, 1971, Pat. No. 4,034,046. This application Dec. 22, 1976, Ser. No. 755,091
Int. Cl.[2] A61L *13/00;* C07C *149/46;* C11D *3/48, 9/50*
U.S. Cl. 252—106 4 Claims

1. A germicidal detergent composition containing a germicidally effective amount of (4-hydroxyphenyl)n-dodecylmethyl sulfonium bromide or chloride.

4,060,496

STAINLESS STEEL CLEANER

Julius F. T. Berliner, Chicago, Ill., assignor to Burnishine Products Inc., Skokie, Ill.

Filed Apr. 29, 1976, Ser. No. 681,716
Int. Cl.[2] C23G *5/02;* C11D *7/50*
U.S. Cl. 252—171 7 Claims

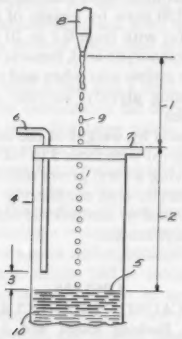
1. A cleaning composition for stainless steel consisting essentially of about 9% to 12% by weight of a halogenated C_2 hydrocarbon having 2 to 4 atoms of a halogen of the group consisting of chlorine and bromine per molecule;
about 3% to 6% by weight of a fatty acid having 10 to 20 carbon atoms per molecule;
about 3% to 5% by weight of an alkanol amine having 2 to 12 carbon atoms and 1 to 2 amino groups per molecule;
about 25% to 30% by weight of a water-soluble C_1 to C_4 alkyl glycol ether; and
the balance of the composition being water;
said composition being a stable, clear non-flammable solution.

4,060,497

PROCESS FOR THE PRODUCTION OF SPHERICAL FUEL AND FERTILE PARTICLES

Hans Huschka, Hanau, and Martin Kadner, Maintal, both of Germany, assignors to HOBEG Hochtemperaturreaktor-Brennelement GmbH, Hanau, Germany

Filed Dec. 8, 1975, Ser. No. 638,662
Claims priority, application Germany, Dec. 16, 1974, 2459445
Int. Cl.[2] C01G *43/02*
U.S. Cl. 252—301.1 S 7 Claims



1. A process of forming uniform spherical particles of fuel particles, fertile particles or a mixture of fuel and fertile particles comprising flowing an oscillating liquid stream comprising a solution of a uranium compound, a thorium compund or a mixture of a uranium compound and a thorium compound from at least one nozzle at a rate of at least 3,000 drops per minute, determining the boundary between a first falling zone free of ammonia and a second falling zone containing ammonia by stroboscopically measuring the roundness of the drops, passing the drops through said first falling zone free of ammonia, regulating the length of the first falling zone so that the drops have just taken on an exact spherical form, then passing the drops through a second falling zone containing ammonia flowing both countercurrently to the falling drops and also horizontally cross currently to the drops in an amount guaranteeing that the space between the drops is filled with ammonia, the length of said second falling zone being 150 to 300 mm and being so regulated that the spherical drops are sufficiently hardened before immersion in an ammonia solution directly below said second zone that they are not deformed by contact with said solution and then passing said hardened drops from said second zone into said ammonia solution.

4,060,498

PROCESS FOR STEAM REFORMING OF HYDROCARBONS

Hiroshi Kawagoshi, Hitachi; Masato Takeuchi, Katsuta, and Fumito Nakajima, Hitachi, all of Japan, assignors to Hitachi, Ltd., Japan

Division of Ser. No. 364,427, May 29, 1973, abandoned. This application Nov. 4, 1974, Ser. No. 520,950
Claims priority, application Japan, June 2, 1972, 47-55241
Int. Cl.[2] C07C *2/14*
U.S. Cl. 252—373 10 Claims

1. In a process for steam reforming gaseous hydrocarbons selected from the group consisting of methane, liquefied natural gas, liquefied petroleum gas, butane, hexane, petroleum light distillates, naphtha and off-gas from processes utilizing various hydrocarbons as feeds, wherein the hydrocarbons are passed in a gaseous state through a catalyst together with steam at an elevated temperature under pressure whereby the hydrocarbons are subjected to a steam reforming reaction wherein the resulting product gas consists mainly of hydrogen, carbon monoxide, carbon dioxide, methane and steam with the relationship among these product components being represented by the following equilibrium equations:

$$CH_4 + H_2O \rightleftarrows CO + 3H_2$$

$$CO + H_2O \rightleftarrows CO_2 + H_2$$

the improvement wherein when said off-gas is the feed, said off-gas comprises paraffinic hydrocarbons and up to about 15% by volume of olefinic hydrocarbons and wherein said catalyst consists essentially of from 3% to 30% by weight of nickel in terms of NiO, based on the catalyst, at least 2 mg-atoms of silver per 100 gram of the catalyst, at least one rare earth element in an atomic ratio of the rare earth element to silver of 0.2 to 10, and a heat-resistant carrier, the elevated temperature being from 350 to 900° C. and the pressure being from 1 to 50 kg/cm^2.

4,060,499

COPPER CHLORIDE/BORON NITRIDE CATALYST FOR SUBSTITUTION CHLORINATION

Wim J. M. Pieters, Morristown; Emery J. Carlson, Chatham, and Guido P. Pez, Boonton, all of N.J., assignors to Allied Chemical Corporation, Morris Township, N.J.

Filed Jan. 24, 1977, Ser. No. 761,561
Int. Cl.[2] B01J *21/00, 27/06;* C07C *17/00*
U.S. Cl. 252—432 3 Claims

1. Composition useful as catalyst for substitution chlorination of partially chlorinated organic material by action of elemental chlorine, or hydrogen chloride, and elemental oxygen in vapor phase at elevated temperature, which composition consists essentially of at least 10% by weight of copper, as cuprous chloride, intercalated in boron nitride.

3. Process for producing the composition of claim 1, which process comprises heating copper chloride and boron nitride in

weight ratio in the range of about 0.3:1 to 10:1, calculated as cuprous chloride, at a temperature in the range of about 550° to 800° C. in an inert environment, maintained dry and substantially free of oxygen.

4,060,500

PREPARATION OF MIXED METAL OXIDES BY DECOMPOSITION OF CARBONATE SOLID SOLUTIONS HAVING THE CALCITE STRUCTURE

LeRoy R. Clavenna, Baytown, Tex.; John M. Longo, New Providence, and Harold S. Horowitz, Clark, both of N.J., assignors to Exxon Research and Engineering Company, Linden, N.J.

Filed May 10, 1976, Ser. No. 684,744
Int. Cl.[2] B01J *23/04, 23/06, 23/34, 23/84*
U.S. Cl. 252—471 45 Claims

1. A method for the preparation of mixed metal oxides of the formula:

$$Ca_{(a)}Fe_{(b)}Co_{(c)}Zn_{(d)}Cd_{(e)}Mg_{(f)}Mn_{(g)}[0]_Q$$

wherein Q is 1, a to g are decimals ranging from 0 to <1 with a minimum, when the metal cation is present at all of 0.01 and wherein the sum of the products of each cation subscript times the respective cation valence equals 2(Q), which method comprises the steps of:

1. dissolving individual metal salts in water to give metal salt solutions;
2. mixing 2 or more of the metal salt solutions of (1) in appropriate molar amounts, provided they do not result in formation of a spontaneous precipitate, to give a solution which when contacted with a source of carbonate ions will yield only a single phase calcite structure carbonate precipitate having the metal ion stoichiometry desired in the final product;
3. mixing the solution of step (2) with a source of carbonate ions thereby yielding a single phase mixed metal carbonate solid solution precipitate having a calcite structure;
4. separating the precipitate from the solution;
5. firing the isolated precipitate under oxidizing conditions for a time at a temperature of from 300° to 900° C thereby yielding the mixed metal oxide.

4,060,501

NOVOLAK DERIVATIVES AS DEFOAMERS

Carter G. Naylor, and Ernest L. Yeakey, both of Austin, Tex., assignors to Texaco Development Corporation, New York, N.Y.

Filed Aug. 30, 1976, Ser. No. 718,640
Int. Cl.[2] C11D *1/72, 1/76, 3/20*
U.S. Cl. 252—548 20 Claims

1. A composition useful as a defoamer and foam inhibitor comprising the reaction product obtained by alkoxylating a novolak resin having a functionality less than 3, said alkoxylation being carried out with ethylene oxide and a higher alkylene oxide of 3 carbons or more in a manner such that the final defoamer composition has a cloud point of 10°–60° C by first alkoxylating said novolak resin with ethylene oxide or a mixture of ethylene oxide and said higher alkylene oxide wherein said ethylene oxide predominates in said mixture, and effecting a final alkoxylation with said higher alkylene oxide or a mixture of ethylene oxide and said higher alkylene oxide wherein said higher alkylene oxide predominates.

4,060,502

SPONGE RUBBER RUG UNDERLAY HAVING IMPROVED LOAD BEARING CAPACITY

Richard E. Benton, Alliance, Ohio, assignor to The General Tire & Rubber Company, Akron, Ohio

Filed Feb. 14, 1974, Ser. No. 442,539
Int. Cl.[2] C08J *9/10;* C08K *5/01*
U.S. Cl. 260—2.5 P 7 Claims

1. A flexible sponge rubber comprising
   a. about 100 parts of a mixture consisting of rubber and from 10 to 40 parts of a resin selected from the group consisting of polyvinyl chloride and copolymers of chloride
   b. from about 100 to about 300 parts of a reinforcing filler and
   c. from about 50 to about 200 parts of oil.

4,060,503

ADHESIVE COMPOSITION

George W. Feeney, Akron, and Bruce W. Habeck, Cuyahoga Falls, both of, OH, assignors to The Goodyear Tire & Rubber Company, Akron, Ohio

Continuation of Ser. No. 552,688, Feb. 24, 1975, abandoned.
This application Jan. 10, 1977, Ser. No. 758,264
Int. Cl.[2] C08L *7/00*
U.S. Cl. 260—5 8 Claims

1. A rubber, α-methylstyrene-modified piperylene/2-methyl-2-butene resin adhesive composition which comprises an admixture of (1) about 100 parts by weight of a rubber comprised of at least one of natural rubber, synthetic cis-1,4-polyisoprene elastomer, and an unvulcanized elastomeric styrene/isoprene block copolymer having the general configuration A - B - A wherein each A is an independently selected nonelastomeric styrene polymer block having an average molecular weight of about 2,000 to about 100,000 and a glass transition temperature above about 25° C., the total block A content being from about 10 to about 50 percent by weight of the copolymer, and B is an elastomeric conjugated diene block of polyisoprene having an average molecular weight from about 25,000 to about 1,000,000 and a glass transition temperature below about 10° C., said copolymer having a tensile strength at 25° C. in excess of about 200 pounds per square inch, and (2) about 60 to about 140 parts by weight of a compatible piperylene/2-methyl-2-butene type, thermoplastic tackifying resin, modified with a minor amount of α-methylstyrene containing carbon-to-carbon unsaturation therein and having a softening point in the range of about 80° C. to about 105° C. prepared by the method which comprises reacting in the presence of an aliphatic hydrocarbon solvent and a catalyst selected from at least one of aluminum chloride and ethylaluminum dichloride, a monomer mixture consisting of about 92 to about 99 weight percent of a diolefin/olefin mixture of a weight ratio in the range of about 0.6/1 to about 1.4/1 and, correspondingly, about 8 to about 1 weight percent α-methylstyrene, where said diolefin is at least about 95 weight percent piperylene and said olefin is 2-methyl-2-butene; wherein said diolefin is optionally modified by containing up to about 5 weight percent isoprene and wherein said monomer mixture is optionally modified by containing up to about 10 weight percent of at least one monomer selected from the group consisting of piperylene dimers, piperylene trimers, 2-methyl-1-butene, 2-methyl-2-pentene, 2-methyl-1-pentene, 2,3-dimethyl-1-butene, 2,3-dimethyl-2-butene, 2-methyl-2-pentene, cyclopentene and 1,3-cyclopentadiene.

4,060,504

EMULSIFIABLE RESOLES HAVING DISPERSED INERT SALTS

Harold P. Higginbottom, Wilbraham, Mass., assignor to Monsanto Company, St. Louis, Mo.

Filed Sept. 15, 1975, Ser. No. 613,651
Int. Cl.[2] C08L *89/00;* C08K *3/18*
U.S. Cl. 260—7 18 Claims

1. An improved stable aqueous solution of an emulsifiable resole wherein the solution has a pH in the range 6 to 8.5 and contains less than 2 percent of free phenol, less than 2 percent of free formaldehyde, said resole has a number average molecular weight of less than 300, a water tolerance between about 100 and 800 percent, a combined formaldehyde to phenol molar ratio in the range of 2.0:1 to 2.9:1, and contains sufficient methylolated 2,2'-and 2,4'-dihydroxydiphenylmethanes to inhibit crystallization of the resole solution, said resole being prepared with a catalyst comprising alkaline earth metal hy-

droxides selected from the group consisting of calcium, barium, strontium and mixtures thereof wherein said improvement comprises: said pH being adjusted with a compound selected from the group consisting of oxalic acid, ammonium oxalate and mixtures thereof providing a stable colloidal dispersion of insoluble oxalate salts of said alkaline earth metal ions in said solution, said resole and said salts being emulsifiable by about 1 to 12 percent by weight of an emulsifier based on the weight of said resole, said emulsifier being selected to provide a stable emulsion of the resole and salt when water in excess of the water tolerance is added to said solution.

4,060,505

COMPOSITIONS FOR SOURING AND SOFTENING LAUNDERED TEXTILE MATERIALS AND STOCK SOLUTIONS PREPARED THEREFROM

John D. Ciko, Allen Park, and John J. Cramer, Grosse Ile, both of Mich., assignors to BASF Wyandotte Corporation, Wyandotte, Mich.

Continuation-in-part of Ser. No. 541,448, Jan. 16, 1975, Pat. No. 3,984,335. This application Aug. 27, 1976, Ser. No. 718,219

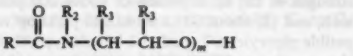
The portion of the term of this patent subsequent to Oct. 5, 1993, has been disclaimed.

Int. Cl.[2] D06M *1/14, 5/04*

U.S. Cl. 252—8.8 **54 Claims**

1. A stable homogeneous liquid composition for souring laundered textile materials and imparting softness thereto consisting essentially of

I. 0.5–25% by weight of a fatty amide softening agent for textile materials corresponding to the structural formula



wherein R is selected from the group consisting of monovalent alkyl radicals and sulfonated monovalent alkyl radicals containing about 8–22 carbon atoms, R_2 is selected from the group consisting of hydrogen and

wherein R is as defined above, R_3 is selected from the group consisting of hydrogen and monovalent alkyl radicals containing 1–2 carbon atoms, and *m* is 2–6;

II. 7.5–75% by weight of an acidic souring agent for laundered textile materials, the souring agent being a water soluble organic carboxylic acid containing about 1–20 carbon atoms and having a primary ionization constant between about 10^{-1} and 10^{-5}, and

III. 0–92% by weight of water;

the said ingredients I and II being present in amounts whereby laundered textile materials are effectively softened and simultaneously soured upon treatment with the said liquid composition, and

the said ingredients I, II and III being present in amounts whereby a stable homogeneous liquid composition is produced.

4,060,506

STARCH ACRYLAMIDES AND THE METHOD FOR PREPARING THE SAME

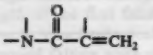
Frank Verbanac, Decatur, Ill., assignor to A. E. Staley Manufacturing Company, Decatur, Ill.

Filed Apr. 27, 1976, Ser. No. 680,646

Int. Cl.[2] C08L *3/00*

U.S. Cl. 260—17.4 GC **41 Claims**

1. A starch acrylamide suitable for use in preparing starch polymerizates which contain recurring and interpolymerized starch acrylamide units, said starch acrylamide comprising a starch chain and appendant acrylamide groups contiguously attached to said starch chain with said appendant group being characterized as containing terminal



moieties.

4,060,507

AMINOPOLYAMIDE-ACRYLAMIDE-GLYOXAL RESIN

Don E. Floyd, and Demetri Potente, both of Minneapolis, Minn., assignors to General Mills Chemicals, Inc., Minneapolis, Minn.

Filed Aug. 1, 1975, Ser. No. 601,143

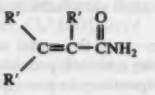
Int. Cl.[2] C08G *12/04;* C08L *61/20;* D21D *3/00;* D21H *3/52*

U.S. Cl. 260—21 **8 Claims**

1. An aminopolyamide-acrylamide-glyoxal resin prepared by reacting

a. a polymeric fat acid aminopolyamide having an amide number of about 150 to 600

b. an amount of an unsaturated amide sufficient to react with substantially all the amine groups in the aminopolyamide, said unsaturated amide having the formula



where R'is hydrogen or an alkyl group containing up to 6 carbon atoms and

c. reacting the resulting aminopolyamideunsaturated amide adduct with about 0.3 to 1.5 moles of glyoxal per amide group present in said adduct.

8. A sized paper treated with about 0.03 to 5 percent by weight based on the weight of paper of the resin defined in claim 1.

4,060,508

STABILIZER COMPOSITION FOR CHLORINE-CONTAINING POLYMERS

Yujiro Sugahara, Tokyo; Yoshibumi Noshi, Tsuruoka; Hiroyuki Naito, Tsuruoka, and Seiichi Nakamura, Tsuruoka, all of Japan, assignors to Mizusawa Kagaku Kogyo Kabushiki Kaisha, Osaka, Japan

Filed Nov. 14, 1975, Ser. No. 632,009

Claims priority, application Japan, Nov. 15, 1974, 49-131165

Int. Cl.[2] C08L *91/00*

U.S. Cl. 260—23 XA **32 Claims**

1. A stabilizer composition for chlorine-containing polymers having a much reduced tendency to blow at the molding step, which comprises (A) an inorganic stabilizer having a pore volume of at least 0.5 cc/g, said stabilizer (A) consisting essentially of at least one member selected from the group consisting of silicates of metals of Groups II and IV of the Periodic Table and composites of silicic acid with oxides, hydroxides and carbonates of said metals, and (B) an organic additive having a boiling point or decomposition point higher than a chlorine-containing polymer processing temperature, said organic additive (B) being incorporated into the stabilizer (A) so that the organic additive (B) is impregnated and permeated uniformly into the pores of stabilizer (A) at a weight ratio (A) : (B) of 1 : at least 0.1 so that the pore volume ratio defined by the following formula:

$$R = \frac{PVc}{PVa}$$

wherein PVc denotes the pore volume (cc/g) of the entire composition and PVa denotes the pore volume (cc/g) of said inorganic stabilizer (A),

is not higher than 0.8.

25. A stabilized chlorine-containing polymer composition comprising a chlorine-containing polymer and a stabilized amount of the stabilizing composition of claim 1.

4,060,509

SOLID, RAPID-SETTING, RIGID POLYURETHANES

Franciszek Olstowski, Freeport, Tex., assignor to The Dow Chemical Company, Midland, Mich.

Continuation of Ser. No. 573,714, May 1, 1975, Pat. No. 3,966,662, which is a division of Ser. No. 405,244, Oct. 10, 1973, Pat. No. 4,001,166, which is a continuation-in-part of Ser. No. 327,630, Jan. 29, 1973, abandoned, which is a continuation-in-part of Ser. No. 221,784, Jan. 28, 1972, abandoned. This application May 19, 1976, Ser. No. 687,801
The portion of the term of this patent subsequent to June 29, 1993, has been disclaimed.
Int. Cl.[2] C08K *5/52*
U.S. Cl. 260—30.6 R 14 Claims

1. A rigid, non-cellular, solid composition having a density of at least 1 g/cc, a percent elongation of less than 100 and which is demoldable within about 5 minutes, without the application of an external source of heat, after admixture in the absence of a catalytic quantity of a catalyst for urethane formation and also in the absence of a chemically hindered aromatic diamine of the components of a rapid-setting polyurethane-forming composition comprising

A. an amine initiated polyol having an OH equivalent weight of from about 50 to less than about 250 and from about 3 to about 8 hydroxyl groups;

B. an organic aromatic polyisocyanate;

C. a liquid modifier compound having a boiling point above about 150° C selected from the group consisting of organic phosphates, organic phosphites, organic phosphonates and mixtures thereof; and

wherein Components (A) and (B) are present in quantities such that the NCO:OH ratio is from about 0.8:1 to about 1.5:1 and Component (C) is employed in quantities of from about 5% to about 60% by weight of the combined weight of components (A), (B) and (C).

4,060,510

DRY BLENDING PROCESS

Glenn R. Himes, Houston, Tex., assignor to Shell Oil Company, Houston, Tex.

Filed Oct. 4, 1976, Ser. No. 729,241
Int. Cl.[2] C08K *5/01;* C08L *53/02*
U.S. Cl. 260—33.6 AQ 8 Claims

1. An improvement in the process for dry blending a polymeric composition in a mixing vessel, said composition having various components including:

a. 100 parts by weight of a thermoplastic elastomer, said thermoplastic elastomer being a block copolymer having at least two monoalkenyl arene polymer end blocks A and at least one elastomeric conjugated diene mid block B, each block A having an average molecular weight between about 5,000 and about 125,000 and each block B having an average molecular weight between about 15,000 and about 250,000, said blocks A comprising 8–55% by weight of the copolymer, said block copolymer having an average particle size of between about 0.1 mm and about 2.0 mm,

b. between about 25 and about 150 parts by weight of a thermoplastic polymer having an average particle size of between about 0.1 mm and 2.0 mm, and

c. between about 5 and about 175 parts by weight of a plasticizer,

which improvement comprises dry blending the various components at a temperature of between about 175° F and about 250° F.

4,060,511

PIGMENTED, PARTICULATE POWDER COATING COMPOSITION

Richard G. Sinclair, Columbus, and George E. Cremeans, Groveport, both of Ohio, assignors to The Goodyear Tire & Rubber Company, Akron, Ohio

Filed Jan. 7, 1976, Ser. No. 647,247
Int. Cl.[2] C08J *3/20*
U.S. Cl. 260—34.2 23 Claims

1. In preparing a coating composition involving catalytic polymerization of at least one ethylenically unsaturated monomer in a nonaqueous aliphatic hydrocarbon solvent for said monomer and in the presence of a pigment insoluble in said solvent and in the presence of a dispersion stabilizer having a polymeric segment solvated by said solvent and another segment relatively non-solvated by said solvent and associated with polymer particles which are formed upon said polymerization of said monomer and which are insoluble in said solvent for providing a non-aqueous dispersion of said polymer particles, the improvement of preparing a free-flowing, homogeneous, polymer-coated pigment, particulate powder coating composition through a sequence of steps including:

i. preparing said dispersion stabilizer in a solution containing a coalescing solvent which is an active solvent for said polymer particles;

ii. admixing a portion of the product of (i) with said pigment to form a pigment dispersion;

iii. drying another portion of the product of (i);

iv. admixing the products of (ii) and (iii) in said nonaqueous aliphatic hydrocarbon solvent so that the resulting mixture contains not more than 6000 parts per million by weight of the coalescing solvent with a then adding of said monomer and a carrying forth therein of the catalytic polymerization of at least one ethylenically unsaturated monomer;

v. cooling a resulting polymerizate of (iv); and

vi. drying the cooled polymerizate of (v) to provide the free-flowing, homogeneous, polymer-coated pigment, particulate powder coating composition.

4,060,512

PHYSIOLOGICALLY UNOBJECTIONABLE STABILIZER COMPOSITIONS FOR HALOGENATED POLYOLEFINS

Franz Scheidl, Gersthofen, and Werner Sommer, Sulzbach, Taunus, both of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Germany

Filed May 25, 1976, Ser. No. 689,812
Claims priority, application Germany, May 30, 1975, 2523909
Int. Cl.[2] C08K *5/00*
U.S. Cl. 260—45.8 N 6 Claims

1. Stabilizer compositions for stabilizing molding compositions of halogenated polyolefins, consisting of

A. from 10 to 80 weight % of a neutral or basic aluminum salt of an aliphatic monocarboxylic or dicarboxylic acid having from 6 to 40 carbon atoms or of an aromatic monocarboxylic, dicarboxylic or tricarboxylic acid having 7 to 25 carbon atoms, or mixtures thereof,

B. from 10 to 70 weight % of a secondary or tertiary organic phosphite or of a cyclic phosphite, or mixtures thereof, and

C. from 5 to 70 weight % of an indole carrying in 2-position as substituent either an alkyl group, an alkenyl group or an aryl group, or mixtures thereof.

V 9 6 4 / 5 N 0 2 9 7 7 UMI

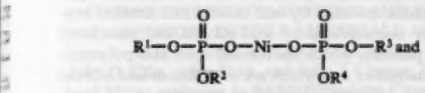
4,060,513

NICKEL ORGANOPHOSPHATE/BENZOPHENONE U.V. STABILIZERS

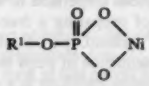
Kenneth Richard Molt, Cincinnati, Ohio, assignor to Cincinnati Milacron, Inc., Cincinnati, Ohio

Filed Apr. 26, 1976, Ser. No. 680,130
Int. Cl.[2] C08K 5/52
U.S. Cl. 260—45.75 N 28 Claims

1. A polyolefin resin composition comprising 1) a polyolefin resin and 2) a stabilizingly effective amount of a stabilizer consisting essentially of in synergistic combination A) a nickel salt of an organic ester of phosphoric acid having the following general formulae

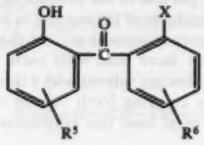


I(a)



I(b)

and B) a benzophenone selected from the group consisting of unsubstituted and substituted 2-hydroxybenzophenone and mixtures thereof and having the general formula



II

wherein R^1, R^2, R^3 and R^4 are the same or different and are alkyl, aryl, cycloalkyl, aralkyl or alkaryl radicals, X is hydroxyl or nothing and both or either R^5 and R^6 are nothing or the same or different straight or branched chain alkyl or alkoxy radical of 1 to 20 carbon atoms or either R^5 and R^6 but not both R^5 and R^6 are bromine, chlorine or fluorine.

4,060,514

PROCESS FOR THE REDUCTION OF COLOR IN POLYPHENYLENE OXIDE RESINS

Dwain M. White, Schenectady, N.Y., assignor to General Electric Company, Schenectady, N.Y.

Continuation-in-part of Ser. No. 431,129, Jan. 7, 1974, abandoned. This application Jan. 19, 1976, Ser. No. 649,981
Int. Cl.[2] C08G 65/44
U.S. Cl. 260—47 ET 14 Claims

1. The process comprising contacting polyphenylene oxide with a phase transfer agent having a cation portion selected from the group consisting of quaternary ammonium, quaternary phosphonium, and tertiary sulfonium ions or mixtures thereof and a reducing agent having an anion portion selected from the group consisting of a dithionite $[S_2O_4]^{32}$ ion, a dithiosulfate $[S_2O_6]^=$ ion, or mixtures thereof.

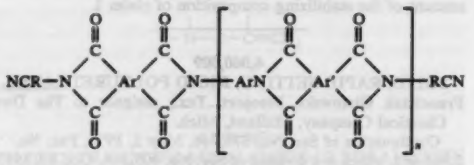
4,060,515

CHAIN-EXTENDING NITRILE END-CAPPED POLYIMIDES

Gaetano Francis D'Alelio, South Bend, Ind., assignor to University of Notre Dame du Lac, Notre Dame, Ind.

Division of Ser. No. 363,801, May 25, 1973, Pat. No. 3,897,395. This application Mar. 14, 1975, Ser. No. 558,452
Int. Cl.[2] C08G 73/12
U.S. Cl. 260—63 R 10 Claims

1. A polymeric chain-extending process comprising: heating at a temperature in the range of about 150°–450° C. a polyimide in the presence of a catalytic amount of a Lewis acid salt catalyst, said polyimide of the formula:



wherein

Ar′ is a tetravalent aromatic organic radical, the four carbonyl groups being attached directly to separate carbon atoms and each pair of carbonyl groups being attached to adjacent carbon atoms in the Ar′ radical,

Ar is a divalent aromatic organic radical,

R is a hydrocarbon radical of 1 to 12 carbon atoms, and

n is a positive integer of at least one.

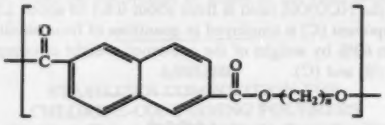
4,060,516

NAPHTHALATE POLYESTER FILAMENTS

Takatoshi Kuratsuji; Shoji Kawase, and Takeo Shima, all of Iwakuni, Japan, assignors to Teijin Limited, Osaka, Japan

Continuation of Ser. No. 480,819, June 19, 1974, abandoned. This application Jan. 5, 1976, Ser. No. 646,645
Claims priority, application Japan, June 19, 1973, 48-68241; June 27, 1973, 48-71641
Int. Cl.[2] C08G 63/18, 63/70
U.S. Cl. 260—75 T 6 Claims

1. Naphthalate polyester fiber consisting essentially of a naphthalate polyester which has an intrinsic viscosity of 0.3 to 3.5 and in which at least 85 mol% of the total recurring units consist of units of the formula



wherein *n* is 4, and up to 15 mol% of the total recurring units consist of units of mono-, di-tri, or tetrafunctional monomers copolymerizable there-with and having at least one diffraction peak at a Bragg scattering angle $2\theta = 16.3° - 16.7°$ in its X-ray diffraction, said fiber having a tenacity of from about 2.5 g/de to about 8.0 g/de.

4,060,517

CONTINUOUS MANUFACTURE OF POLYAMIDES

Friedrich Mertes, Ludwigshafen; Helmut Doerfel, Heidelberg; Eduard Heil, Limburgerhof, and Claus Cordes, Weisenheim, all of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Germany

Filed Mar. 17, 1975, Ser. No. 559,255
Claims priority, application Germany, Apr. 8, 1974, 2417003
Int. Cl.[2] C08G 69/04
U.S. Cl. 260—78 R 3 Claims

1. A process for the manufacture of a polyamide by continuously conveying the aqueous solution of a salt of essentially equivalent amounts of a diamine, or of a mixture of several diamines, and of a dicarboxylic acid, or of a mixture of several dicarboxylic acids, through several reaction zones under polyamide-forming conditions, wherein

a. in a first reaction zone the mixture of starting materials is heated to a temperature of at least 220° C, but not higher than 300° C, at a pressure which is above the corresponding saturation vapor pressure of water and prevents the formation of a vapor phase, until the polycondensation

conversion is at least 80%, but without completing the condensation in this zone,

b. in a second reaction zone the pressure acting on the polycondensation mixture is released adiabatically to a level of not less than 3 atmospheres and not more than 20 atmospheres, so as to reach a temperature below 215° C,

c. in a third reaction zone the polycondensation mixture is heated by means of a heat exchanger consisting of heat exchanger elements connected in parallel, to from 220° to 330° C, in the course of less than 5 minutes, with evaporation of the bulk of the water, at a pressure level not higher than the pressure to which the mixture had previously been expanded,

d. in a fourth reaction zone the polycondensation mixture is separated from the water vapor, and

e. finally the condensation is completed under the conditions prevailing at the end of the third reaction zone to form a high molecular weight filament-forming polyamide.

4,060,518

MANUFACTURE OF POLYAMIDE FILM-FORMING MATERIALS CONTAINING MAGNESIUM SILICATE

Wolfgang-Dieter Jeserich, Frankenthal; Claus Cordes, Weisenheim; Wolfgang Seydl, Frankenthal, and Hans-Peter Weiss, Altrip, all of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Germany

Filed Oct. 8, 1975, Ser. No. 620,713

Claims priority, application Germany, Oct. 25, 1974, 2450673

Int. Cl.² C08G *69/16*

U.S. Cl. 260—78 L **6 Claims**

1. A process for the continuous manufacture of ε-caprolactam polymers for high-grade transparent thin film, which comprises

a. agitating ε-caprolactam continuously in a first reaction zone under polyamide-forming conditions at temperatures of from 240° to 290° C until at least 20% of the ε-caprolactam has reacted, but the melt viscosity of said reacted ε-caprolactam is still less than 500 poises,

b. adding magnesium silicate having a particle size of less than 30 μm to the melt to give magnesium silicate concentrations in the reaction mixture of from 0.0005 to 0.5%, and

c. polymerizing the ε-caprolactam melt at atmospheric pressure or in vacuo to completion until the relative viscosity is from 2.4 to 3.3, said viscosity being calculated as the ratio of the flow times of a 1% solution of polyamide in 96% sulfuric acid and pure 96% sulfuric acid at 25° C in a capillary viscometer.

4,060,519

POLYTHIOL SEALANTS

Richard C. Doss, and Timothy P. Murtha, both of Bartlesville, Okla., assignors to Phillips Petroleum Company, Bartlesville, Okla.

Filed Mar. 1, 1976, Ser. No. 662,779

Int. Cl.² C08G *63/68*; C08L *81/02*

U.S. Cl. 260—79 **14 Claims**

1. Curable sealant and coating compositions comprising (a) a poly(oxyalkylene)-polyester-poly(monosulfide)-polythiol having an average of more than two mercapto groups per molecule and (b) at least one of naphthalene and alkylated naphthalenes as sulfur-solubilizers containing dissolved sulfur, the amount of sulfur present being sufficient to provide some curing in the polymer.

4,060,520

CONTINUOUS REACTION FOR PREPARATION OF ARYLENE SULFIDE POLYMER

Howard B. Irvin, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Filed Mar. 30, 1976, Ser. No. 671,775

Int. Cl.² C08G *75/16*

U.S. Cl. 260—79.1 **6 Claims**

1. A continuous process for producing particulate arylene sulfide polymer by contacting, at reaction conditions, a reaction mixture comprising (1)an organic amide, (2) a dihalo aromatic compound and (3) a sulfur complex produced by contacting sodium N-methylamino butyrate with an organic amide in which H_2S is absorbed, said process comprising:

a. introducing said reaction mixture into a first reaction zone maintained at polymerization conditions at a pressure within the range of about 13.5 Kg/cm² to about 15.0 Kg/cm² and within a temperature range sufficient to evaporate water and small amounts of organic amide and dihalo aromatic compound, maintaining the reaction mixture in said first reaction zone for a time sufficient to permit partial polymerization; and

b. passing the partially polymerized reaction mixture into at least one further reaction zone maintained at polymerization conditions in the same temperature range as the first reaction zone but at a lower pressure than said first reaction zone, the pressure of said second zone within the range of about 12.0 Kg/cm² to about 13.5 Kg/cm², for a time sufficient further to polymerize said reaction mixture and further to evaporate water and organic amide, substantially completing the polymerization reaction therein.

4,060,521

BENZENE-AZO-INDOLE DYESTUFFS

Dieter vor der Brück, Cologne; Richard Sommer, and Gerhard Wolfrum, both of Leverkusen, all of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany

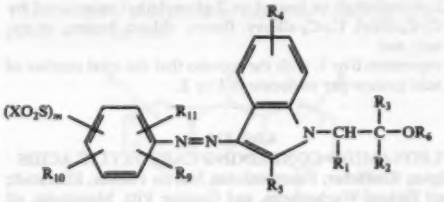
Filed June 17, 1975, Ser. No. 587,656

Claims priority, application Germany, June 26, 1974, 2430682

Int. Cl.² C09B *29/36, 43/18*; D06P *1/06, 3/24*

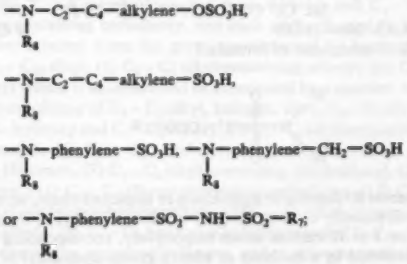
U.S. Cl. 260—165 **14 Claims**

1. Monoazo dyestuff which in the form of the free acid corresponds to the formula



wherein

X represents OH, NH—SO_2—R_7,



or ;

wherein any of said phenylene radicals is unsubstituted or substituted by C_1-C_4-alkyl, C_1-C_4-alkoxy, benzyloxy, chloro, bromo, cyano, or nitro;

R_1 and R_2 represent H; C_1–C_4-alkyl; C_1–C_4-alkyl substituted by C_1–C_4-alkoxy, cyclohexyloxy, benzyloxy, phenoxy, cyano, fluoro, chloro, bromo, OH or C_1–C_4-alkylcarbonyloxy; phenyl; naphthyl; phenyl or naphthyl substituted by phenyl, C_1–C_4-alkyl, fluoro, chloro, bromo, nitro, or C_1–C_4-alkoxy; benzyl; 2-phenylethyl; benzyl or 2-phenylethyl substituted by C_1–C_4-alkyl, C_1–C_4-alkoxy, fluoro, chloro, bromo or cyano; cyclopentyl; cyclohexyl; or carbo-C_1–C_4-alkoxy; provided that at least one of R_1 or R_2 must be hydrogen;

R_3 represents H or C_1–C_4-alkyl,

R_4 represents hydrogen; fluoro; chloro; bromo; cyano; sulpho; C_1–C_4-alkyl; C_1–C_4-alkoxy; C_1–C_4-alkoxy substituted by OH, fluoro, chloro, bromo, or cyano;

R_5 represents C_1–C_4-alkyl; phenyl; naphthyl; phenyl or naphthyl substituted by phenyl, C_1–C_4-alkyl, fluoro, chloro, bromo, nitro, or C_1–C_4-alkoxy;

R_6 represents hydrogen; C_2–C_4-alkylcarbonyl; C_1–C_4-alkoxycarbonyl; sulpho; C_1–C_4-alkylsulphonyl; C_1–C_4-akylaminocarbonyl; phenylcarbonyl; phenyloxycarbonyl; phenylsulphonyl; or phenylaminocarbonyl; wherein any of the said phenyl radicals may be substituted by C_1–C_4-alkyl, fluoro, chloro, bromo, or C_1–C_4-alkoxy;

R_7 represents C_1–C_4-alkyl; di-C_1–C_4-alkylamino, phenyl; naphthyl; phenyl or naphthyl substituted by C_1–C_4-alkyl, fluoro, chloro, bromo, nitro, or C_1–C_4-alkoxy;

R_8 represents hydrogen; C_1–C_4-alkyl; or C_1–C_4-alkyl substituted by fluoro, chloro, bromo, cyano, hydroxyl, or C_1–C_4-alkoxy;

R_9 and R_{10} represent H, chloro; bromo; thiocyanato; cyano; nitro; C_1–C_4-alkyl; C_1–C_4-alkoxy; carbo-C_1–C_4-alkoxy; carbamoyl; sulphamoyl; hydroxyl; trifluoromethyl; C_1–C_4-alkylsulphonyl; phenylsulphonyl; or benzylsulphonyl;

R_{11} represents hydrogen, chloro; bromo; C_1–C_4-alkyl; trifluoromethyl; C_1–C_4-alkylsulphonyl; phenylsulphonyl; benzylsulphonyl; carbamoyl; or sulphamoyl; wherein said carbamoyl and said sulphamoyl radicals in R_9, R_{10}, and R_{11} are unsubstituted, mono- or disubstituted by C_1–C_4-alkyl; C_1–C_4-alkyl substituted by fluoro, chloro, bromo, cyano, hydroxyl, or C_1–C_4-alkoxy; phenyl; naphthyl; phenyl or naphthyl substituted by phenyl, C_1–C_4-alkyl, fluoro, chloro, bromo, nitro, or C_1–C_4-alkoxy; benzyl; 2-phenylethyl; or benzyl or 2-phenylethyl substituted by C_1–C_4-alkyl, C_1–C_4-alkoxy, fluoro, chloro, bromo, or cyano; and

m represents 0 or 1, with the proviso that the total number of acid groups per molecule is 1 or 2.

4,060,522

SULFONAMIDO CONTAINING CARBOXYLIC ACIDS

Wolfgang Kindscher, Fussgoenheim; Martin Fischer, Ellerstadt; Karl Eicken, Wachenheim, and Guenter Vitt, Mannheim, all of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Germany

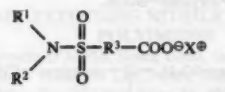
Filed Mar. 15, 1976, Ser. No. 666,975

Claims priority, application Germany, Mar. 15, 1975, 2511400

Int. Cl.² C07D *211/96;* C23F *11/16*

U.S. Cl. 260—293.85 **4 Claims**

1. A compound of formula I



I,

wherein R^1 denotes straight-chain or branched-chain, saturated or olefinically or acetylenically unsaturated alkyl of from 1 to 18 or 3 to 18 carbon atoms respectively, corresponding alkyl substituted by a methoxy or ethoxy group, cycloalkyl of from 5 to 12 ring members, phenyl, phenyl substituted by C_{1-3} alkyl, methoxy or ethoxy groups or halogen atoms, or phenylalkyl of from 1 to 5 carbon atoms in the alkyl group, R^2 denotes hydrogen or R^1, R^1 and R^2 form, together with the nitrogen atoms, a piperidine, pyrrolidine or morpholine ring, R^3 denotes alkylene of from 2 to 5 carbon atoms, and X^+ denotes an alkali metal or ammonium cation or proton.

4,060,523

1-ALKOXY-1-SUBSTITUTED PHENYL-1,3-DEHYDROFURO[3,4-b]QUINOXALINE-4,9-DIOXIDES

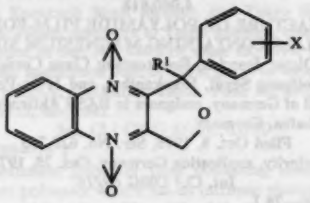
John P. Dirlam, New London, Conn., assignor to Pfizer Inc., New York, N.Y.

Division of Ser. No. 602,480, Aug. 6, 1975, Pat. No. 4,012,385. This application Nov. 3, 1976, Ser. No. 738,300

Int. Cl.² C07D *241/52;* A61K *31/50*

U.S. Cl. 260—250 QN **3 Claims**

1. A compound of the formula



wherein X is selected from the group consisting of hydrogen, hydroxy, nitro, fluoro, chloro, bromo, alkyl having from one to five carbon atoms and alkoxy having from one to five carbon atoms;

and R^1 is alkoxy having from one to five carbon atoms.

4,060,524

6-ACYLAMIDO-2,2-DIMETHYL-3-(PYRIMIDIN-4,6-DIONE-2-YL)PENAMS

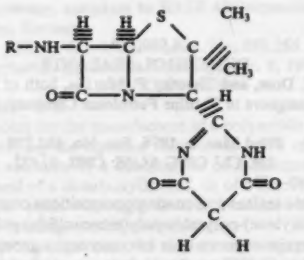
Gene Michael Bright, Groton, Conn., assignor to Pfizer Inc., New York, N.Y.

Division of Ser. No. 669,508, March 23, 1976, Pat. No. 4,028,360. This application Dec. 16, 1976, Ser. No. 751,280

Int. Cl.² A61K *31/43;* C07D *499/46, 499/60, 499/68*

U.S. Cl. 260—256.5 R **5 Claims**

1. A compound having the formula



wherein R is selected from the group consisting of 2-phenylacetyl, 2-phenoxyacetyl, 2-azido-2-phenylacetyl and 2-amino-2-phenylacetyl.

V 9 6 4 / 5 N 0 2 9 7 7 UMI

4,060,525
FIVE- OR SIX-MEMBERED HETEROCYCLIC MONO- AND DIALCOHOLS

Hans Batzer, Arlesheim; Juergen Habermeier, Allschwil, and Daniel Porret, Binningen, all of Switzerland, assignors to Ciba-Geigy AG, Basel, Switzerland

Continuation of Ser. No. 262,422, June 13, 1972, abandoned, which is a continuation-in-part of Ser. No. 109,953, Jan. 26, 1971, Pat. No. 3,828,045. This application Apr. 16, 1975, Ser. No. 568,536

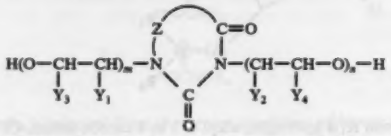
Claims priority, application Switzerland, Jan. 30, 1970, 1347/70; Oct. 8, 1970, 14891/70

The portion of the term of this patent subsequent to Dec. 21, 1988, has been disclaimed.

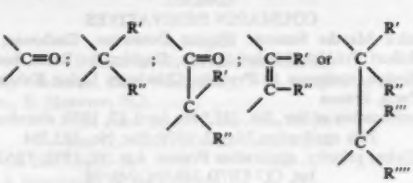
Int. Cl.² C07D *239/54, 233/72*

U.S. Cl. 260—260 6 Claims

1. A mono- or dialcohol of the formula



wherein Y_1 and Y_2 each denotes hydrogen or methyl and Y_3 and Y_4 each denotes methyl or ethyl, the sum of the carbon atoms in Y_1 and Y_3 or Y_2 and Y_4 having always to be 2, or wherein Y_2 and Y_4 together denote trimethylene or tetramethylene, and Z represents a member selected from the group consisting of a divalent residue of the formulae



wherein R′, R″, R‴ and R⁗ each represents a member selected from the group consisting of alkyl with 1 to 4 carbon atoms, alkenyl with 2 to 4 carbon atoms, cyclohexyl, cyclohexenyl, and phenyl, or when Z represents the formula

R′ and R″ together denote tetramethylene and pentamethylene, and *m* and *n* each represents an integer having a value of 0 to 30 with the sum of *m* and *n* having to be at least 1.

4,060,526
1-HETEROCYCLIC ALKYL-1,2,3,4-TETRAHYDROQUINAZOLINONES AND ANALGESIC INTERMEDIATES THEREOF

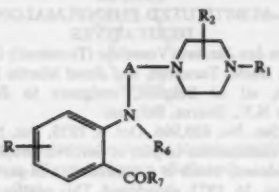
Bola Vithal Shetty, Rockville, Md., assignor to Pennwalt Corporation, Philadelphia, Pa.

Continuation-in-part of Ser. No. 452,587, March 19, 1974, abandoned, which is a continuation of Ser. No. 108,659, Jan. 21, 1971, abandoned, which is a division of Ser. No. 691,955, Dec. 20, 1967, Pat. No. 3,635,976. This application Aug. 23, 1976, Ser. No. 716,925

Int. Cl.² C07D *241/04, 401/12, 295/14*

U.S. Cl. 260—268 PH 6 Claims

1. A member of the group consisting of (a) a compound having the formula:



wherein:

R is H, alkyl of 1–4 carbons, hydroxy, alkoxy of 1–4 carbons, halogen, amino, —NHCOCH₃ or —NHCHO;

A is $(CH_2)_n$, where *n* is 1–5, or branched chain alkyl of 3–5 carbons;

R_1 is alkyl of 1–4 carbons; phenyl; phenyl substituted with NH_2, OH, OCH_3 or Cl; H when R is other than H or halogen; or phenalkyl of 7–10 carbons;

R_2 is H or alkyl of 1–4 carbons;

R_6 is H; alkyl of 1–4 carbons; alkanoyl of 1–4 carbons; benzoyl; phenyl; phenalkyl; or phenyl or phenalkyl substituted in the ring with NH_2, OH, OCH_3 or Cl;

R_7 is piperidyl, pyrrolidyl, $—NH_2$, —NH-alkyl of 1–4 carbons, or —N= (disubstituted with alkyl of 1–4 carbons); and

(b) a pharmacologically acceptable acid addition salt thereof.

4,060,527
PYRIDO[2,3-c]-ACRIDINE-1-HYDROXY-2-CARBOXYLIC ACID DERIVATIVES

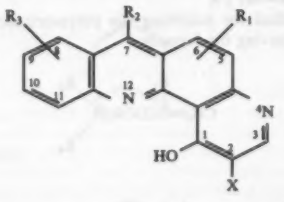
Hiromasa Nakamoto, Takaoka; Shin-Ichi Nakamoto, Oyabe; Hidemitu Amemiya, Takaoka; Souji Miyamura, Takaoka; Motoo Shiba, Takaoka, and Nobuko Nakamura, Takaoka, all of Japan, assignors to Fuji Chemical Industries, Ltd., Japan

Filed June 23, 1975, Ser. No. 589,772

Int. Cl.² C07D *471/04;* A61K *31/47*

U.S. Cl. 260—279 R 3 Claims

1. A member selected from the group consisting of a compound of the formula



wherein X is a member selected from carboxy and C_1 – C_6 alkoxy-containing carbalkoxy, and each of R_1, R_2 and R_3 is a member selected from the group consisting of (1) hydrogen, (2) C_1 – C_{10} alkyl, (3) C_2 – C_6 alkyl-containing alkenyl, (4) C_6 – C_{10} aryl which is unsubstituted or substituted by a member of a group consisting of C_1 – C_3 alkyl, halogen, nitro, C_1 – C_3 alkylamino, hydroxy and C_1 – C_3 alkoxy, (5) C_1 – C_4 alkyl-containing alkylamino, (6) C_1 – C_6 alkyl-containing alkylmercapto, (7) nitro, (8) cyano, (9) C_1 – C_2 alkyl-containing alkylsulfonyl, (10) carboxy, (11) C_1 – C_6 alkoxy-containing carbalkoxy, (12) C_1 – C_6 alkyl-containing hydroxyalkyl, (13) C_1 – C_3 alkyl-containing aminoalkyl, (14) C_1 – C_2 hydroxyalkylamino, and (15) C_1 – C_2 alkyl-containing acetoxyalkylamino and a pharmaceutically acceptable acid addition salt thereof.

4,060,528

AROYL-SUBSTITUTED PHENYLMALONIC ACID DERIVATIVES

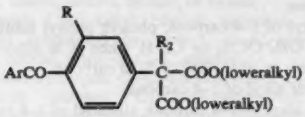
Paul Adriaan Jan Janssen, Vosselaar (Turnhout); Georges Henri Paul Van Daele, Turnhout, and Jozef Martin Boey, Wilrijk (Antwerp), all of Belgium, assignors to Janssen Pharmaceutica N.V., Beerse, Belgium

Division of Ser. No. 620,906, Oct. 8, 1975, Pat. No. 4,035,376, which is a continuation-in-part of Ser. No. 395,877, Sept. 10, 1973, abandoned, which is a continuation-in-part of Ser. No. 300,079, Oct. 24, 1972, abandoned. This application Dec. 10, 1976, Ser. No. 749,574

Int. Cl.[2] C07D *213/55*

U.S. Cl. 260—295 R 9 Claims

1. A diloweralkyl malonate having the formula:



wherein:

ArCO is an aroyl substituent the Ar function of which is a member selected from the group consisting of 2-thienyl, 5-methyl-2-thienyl, 5-chloro-2-thienyl, 2-naphthyl and 3-pyridyl;

R is a member selected from the group consisting of hydrogen, loweralkyl and halo, provided that when said R is halo, then said Ar is 2-thienyl-5-methyl-2-thienyl or 5-chloro2-thienyl;

R_2 is a member selected from the group consisting of hydrogen, allyl and loweralkyl.

4,060,529

POLYMERIZATION INHIBITORS FOR N-SUBSTITUTED AMINOALKYL ACRYLIC MONOMERS

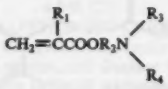
Frank L. Slejko, Bristol, Pa., assignor to Rohm and Haas Company, Philadelphia, Pa.

Continuation-in-part of Ser. No. 477,126, June 6, 1974, abandoned. This application Sept. 11, 1975, Ser. No. 612,401

Int. Cl.[2] C07D *263/06*; C07C *103/133*; C07D *265/06*

U.S. Cl. 260—307 FA 14 Claims

1. A method for inhibiting the polymerization of acrylic monomers having the formula:



where

R_1 is hydrogen or methyl,

R_2 is a divalent alkylene radical of 1 to 5 carbon atoms, and

R_3 is a hydrogen or an alkyl having 1 to 5 carbon atoms,

R_4 is an alkyl having 1 to 5 carbon atoms, or

R_3 and R_4 are taken together with the nitrogen atom to form a five or six membered saturated heterocyclic ring, optionally having at least one of the hetero atoms, N and O, in the ring,

at ambient and above ambient temperatures, said method comprising contacting said monomers with an amount of nabam, mancozeb, maneb, zineb, or a halide, halogenate, sulfate, nitrate, chromate, phosphate or carboxylate of tin (II), copper (I), manganese (II) or cobalt (II), effective to inhibit the polymerization of the monomers during the preparation, purification or storage of said monomers.

4,060,530

CLAVULANIC ACID AMIDES

Thomas Trefor Howarth, Ewhurst, and John Barry Harbridge, Coulsdon, both of England, assignors to Beecham Group Limited, Great Britain

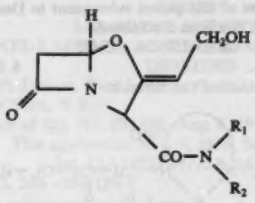
Filed June 28, 1976, Ser. No. 700,493

Claims priority, application United Kingdom, July 4, 1975, 28206/75

Int. Cl.[2] C07D *498/04*

U.S. Cl. 260—307 FA 7 Claims

1. A compound of the formula (II):



(II)

wherein R_1 is hydrogen, alkyl of 1 to 4 carbon atoms, CF_3CH_2, phenyl, tolyl or benzyl and R_2 is hydrogen or alkyl of 1 to 4 carbon atoms.

4,060,531

COUMARIN DERIVATIVES

Annick Marthe Suzanne Simone Domergue, Eaubonne, and Robert Frédéric Michel Sureau, Enghien les Bains, both of France, assignors to Produits Chimiques Ugine Kuhlmann, Paris, France

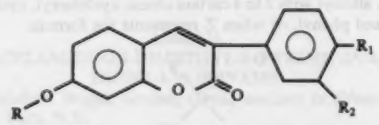
Continuation of Ser. No. 351,942, April 17, 1973, abandoned. This application May 3, 1976, Ser. No. 682,294

Claims priority, application France, Apr. 18, 1972, 72.13524

Int. Cl.[2] C07D *249/06*, *249/08*

U.S. Cl. 260—308 R 10 Claims

1. Coumarin compound of the formula:



in which R represents an alkyl group containing 1 to 5 carbon atoms, one of the substituents R_1 or R_2 represents a triazole radical selected from the group consisting of 1,2,4-triazol-1-yl, 1,2,3-triazol-4-yl and 1,2,3-triazol-2-yl, and the other represents hydrogen or chlorine, or an alkyl group containing from 1 to 3 carbon atoms, the triazole radical being unsubstituted or substituted by one or two alkyl groups containing from 1 to 3 carbon atoms.

4,060,532

HALOGENATED DIOXOLANE TRANQUILIZERS

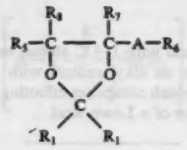
Ludwig A. Hartmann, Wilmington, Del., assignor to ICI United States Inc., Wilmington, Del.

Continuation-in-part of Ser. No. 235,025, March 15, 1972, abandoned. This application Mar. 28, 1972, Ser. No. 238,956

Int. Cl.[2] C07D *317/28*

U.S. Cl. 260—340.9 R 17 Claims

1. A compound of the formula



wherein each R_1 is independently selected from the group consisting of perhalogenated alkyl radicals having from 1 to 7 carbon atoms and wherein each halogen atom has an atomic weight of at most 80, A is an alkylene radical having from 1 to 6 carbon atoms, R_4 is selected from the group consisting of

where R_4 is selected from the group consisting of lower alkyl radicals having from 1 to 4 carbon atoms, phenyl, tolyl, monochlorophenyl, and cyclohexyl, R_5 is selected from the group consisting of hydrogen, alkyl having no more than 6 carbon atoms and —A—R_6, R_7 is hydrogen and R_8 is independently selected from the group consisting of hydrogen and lower alkyl radicals having from 1 to 4 carbon atoms,

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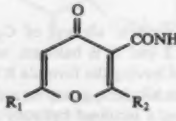
4,060,533

PYRANONE CARBOXAMIDES

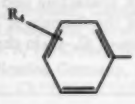
Jeffrey Nadelson, Lake Parsippany, N.J., assignor to Sandoz, Inc., E. Hanover, N.J.

Filed June 25, 1976, Ser. No. 700,066
Int. Cl.² C07D *309/22;* A61K *31/35*
U.S. Cl. 260—345.7 R **4 Claims**

1. A compound of the formula

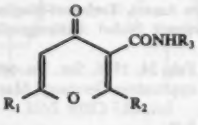


where
R_1 and R_2 represent
where

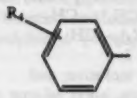


R_4 is hydrogen, halogen having an atomic weight of from 19 to 36, lower alkoxy or lower alkyl; and
R_3 is lower alkyl.

3. A compound of the formula



where
R_1 and R_2 each independently is lower alkyl or



where
R_4 is hydrogen, halogen having an atomic weight of from 19 to 36, lower alkoxy or lower alkyl; and
R_3 is lower alkyl.

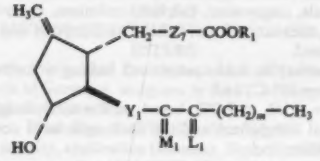
4,060,534

9-DEOXY-9-METHYLENE-PGF COMPOUNDS

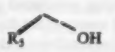
Gordon L. Bundy, Portage, Mich., assignor to The Upjohn Company, Kalamazoo, Mich.

Continuation-in-part of Ser. No. 651,622, Jan. 23, 1976, Pat. No. 4,021,467, which is a division of Ser. No. 556,768, March 10, 1975, Pat. No. 3,950,363. This application May 4, 1976, Ser. No. 682,848
Int. Cl.² C07C *177/00*
U.S. Cl. 260—408 **226 Claims**

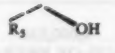
1. A prostaglandin analog of the formula:



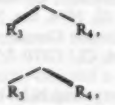
wherein Y_1 is trans—CH=CH—, —C≡C—, or —CH_2CH_2—;
wherein M_1 is



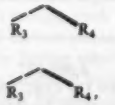
or



wherein R_5 is hydrogen or methyl;
wherein L_1 is



or a mixture of



wherein R_3 and R_4 are hydrogen, methyl, or fluoro, being the same or different, with the proviso that one of R_3 and R_4 is fluoro only when the other is hydrogen or fluoro;
wherein Z_7 is
1. cis—CH=CH—CH_2—$(CH_2)_4$—CH_2—,
2. cis—CH=CH—CH_2—$(CH_2)_4$—CF_2—,
3. cis—CH_2—CH=CH—$(CH_2)_4$—CH_2—,
4. —$(CH_2)_3$—$(CH_2)_4$—CH_2—,
5. —$(CH_2)_3$—$(CH_2)_4$—CF_2—,

6. $-CH_2-O-CH_2-(CH_2)_g-CH_2-$,
7. $-C\equiv C-CH_2-(CH_2)_g-CH_2-$, or
$-CH_2-C\equiv C-(CH_2)_g-CH_2-$,

wherein g is one, 2, or 3;
wherein *m* is one to 5, inclusive; and
wherein R_1 is hydrogen, alkyl of one to 12 carbon atoms, inclusive, cycloalkyl of 3 to 10 carbon atoms, inclusive, aralkyl of 7 to 12 carbon atoms, inclusive, phenyl, phenyl substituted with one, two, or three chloro or alkyl of one to 3 carbon atoms, inclusive, or a pharmacologically acceptable cation.

4,060,535
PROCESS FOR THE PRODUCTION OF METAL SALTS OF ORGANIC ACIDS

Salvatore A. Cinco, Succasunna, N.J., assignor to Tenneco Chemicals, Inc., Saddle Brook, N.J.

Filed Aug. 31, 1976, Ser. No. 719,301
Int. Cl.² C11C *1/00*
U.S. Cl. 260—414 10 Claims

1. The process for the production of finely-divided metal salts of carboxylic acids that comprises the steps of

a. forming a reaction mixture that consists essentially of
   1. a metal component selected from the group consisting of the oxides, hydroxides, and carbonates of the alkali metals, magnesium, calcium, cadmium, strontium, barium, mercury, nickel, cobalt, lead, copper, and mixtures thereof,
   2. a carbxylic acid component having a melting point above 20° C., and
   3. from 0.1% to 8.0%, based on the total weight of the metal component and the carboxylic acid component, of water and

b. subjecting said reaction mixture to vigorous agitation in an apparatus having an attrition and shearing action at a temperature that is below the melting point of the carboxylic acid component and below the melting point of the metal salt that is being produced until substantially all of the carboxylic acid component has reacted.

7. The process of claim 1 wherein the carboxylic acid component of the reaction mixture formed in Step a) comprises stearic acid.

4,060,536
METHOD OF PREPARING N,N'-BIS-TRIMETHYLSILYLUREA

Hans-Joachim Kötzsch, Rheinfelden, and Hans-Joachim Vahlensieck, Wehr, both of Germany, assignors to Dynamit Nobel Aktiengesellschaft, Troisdorf, Germany

Filed Nov. 30, 1976, Ser. No. 746,023
Claims priority, application Germany, Dec. 1, 1975, 2553932
Int. Cl.² C07F *7/10*
U.S. Cl. 260—448.2 E 10 Claims

1. In a process for preparing N,N'-bis-trimethylsilylurea by contacting urea with hexamethyldisilazane at elevated temperature sufficient to evolve ammonia, the improvement which comprises carrying out the process in the presence of an acid catalyst, which acid catalyst is a Lewis acid or a hydrogen ion yielding acid.

4,060,537
PREPARATION OF ORGANOSILOXANES

Günther Maass, Cologne; Hans Joachim Lücking; Werner Büchner, both of Leverkusen, and Bruno Degen, Schildgen, all of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany

Filed Dec. 3, 1976, Ser. No. 747,262
Claims priority, application Germany, Dec. 20, 1975, 2557624
Int. Cl.² C07F *7/08*
U.S. Cl. 260—448.2 E 6 Claims

1. In the preparation of cyclic and linear organosiloxanes by reacting an organohalogenosilane with a compound of the formula

ROR'

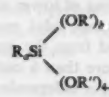
in which
R is an alkyl radical with 1–4 C atoms, and
R' is hydrogen or an alkyl radical with 1–4 C atoms, the improvement which comprises effecting the reaction in an aqueous solution of a Lewis acid.

4,060,538
PROCESS FOR THE PREPARATION OF SILANE ESTERS OF TERTIARY ALCOHOLS

Hans Joachim Kötzsch, Rheinfelden; Hans-Joachim Vahlensieck, Wehr, and Claus-Dieter Seiler, Rheinfelden, all of Germany, assignors to Dynamit Nobel Aktiengesellschaft, Troisdorf Berz. Cologne, Germany

Filed Jan. 25, 1974, Ser. No. 436,759
Claims priority, application Germany, Jan. 31, 1973, 23045036
Int. Cl.² C07F *7/04, 7/18*
U.S. Cl. 260—448.8 R 32 Claims

1. An alkoxysilane of the formula



wherein R is hydrogen, or an alkenyl radical of C_2–C_{10};
R' is alkyl of 1–8 carbon atoms, alkylene or a polyhydroxy alkylene group having a terminal hydroxy alkyl group;
R'' is a tertiary alkyl of 4 to 8 carbon atoms;
a is 1 or 2;
b is 1 or 2; and
$a + b$ does not exceed 3.

17. A process for preparing a compound of claim 1 which comprises the steps of:

A. contacting in the liquid phase and without contacting in the gas phase hydrogen silane of the formula

R_2SiX_{4-a}

wherein R is hydrogen, alkenyl of C_2–C_{10} or alkyl of C_1–C_4, *a* is 1 or 2 and X is halogen, with a primary or secondary alcohol having the formula R'OH wherein R' is an alkyl group, an alkylene group or a polyhydroxyalkylene group having a terminal hydroxy alkyl group; said alcohol present in an amount not in excess of a 10% stoichiometric excess relative to the halogen alkoxysilane thereby produced;

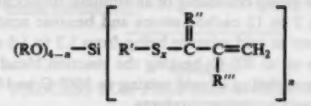
B. thereafter without isolating the resultant halogen alkoxysilane from step A contacting said halogen alkoxysilane with an alcohol of the formula R''OH wherein R'' is a tertiary alkyl group of C_4–C_8 in the presence of an acid binding agent.

4,060,539
SULFUROUS ORGANIC SILICON COMPOUNDS, A PROCESS FOR THEIR PREPARATION, AND THEIR USE AS ADHESIVIZING AGENTS

Claus-Dietrich Seiler, Rheinfelden; Hans-Joachim Vahlensieck, Wehr, and Jürgen Amort, Troisdorf-Sieglar, all of Germany, assignors to Dynamit Nobel Aktiengesellschaft, Troisdorf, Germany

Filed Feb. 24, 1976, Ser. No. 660,952
Claims priority, application Germany, Mar. 1, 1975, 2508931
Int. Cl.² C07F *7/18*
U.S. Cl. 260—448.8 R 18 Claims

1. A sulfur-containing organosilicon compound of the formula



wherein
R is a C_{1-4} alkyl, cycloalkyl, C_{2-3} alkoxyalkyl or phenyl radical,
R' is a branched or unbranched alkylene radical having 1 to 6 carbon atoms, phenylene or benzyl radical,
R'' is an oxygen or sulfur atom
R''' is a hydrogen atom or a methyl group,
n is 1 or 2,
x is 1 or 2
or a hydrolysis product thereof.

4,060,540

NOVEL 3-TRIPHENYLMETHOXY-1-ALKYNES, 3-TRIPHENYL-METHOXY-1-TRANS-ALKENYL-DIALKYL-ALANES, AND LITHIUM 3-TRIPHENYLMETHOXY-1-TRANS-ALKENYL-DIALKYL ALANATES

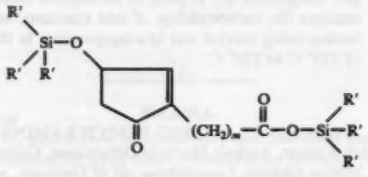
Karel Francis Bernady; Middleton Brawner Floyd, Jr., both of Suffern; John Frank Poletto, Nanuet, all of N.Y.; Robert Eugene Schaub, Upper Saddle River, and Martin Joseph Weiss, Oradell, both of N.J., assignors to American Cyanamid Company, Stamford, Conn.

Division of Ser. No. 613,776, Sept. 18, 1975, Pat. No. 4,007,210, which is a division of Ser. No. 355,350, April 27, 1973, Pat. No. 3,932,479. This application Nov. 5, 1976, Ser. No. 739,174

Int. Cl.² C07F *7/18*

U.S. Cl. 260—448.8 R **2 Claims**

1. Compounds of the formula:



wherein *m* is an integer having the value of 4 to 8, inclusive, and R' are alkyl groups having from 1 to 10 carbon atoms and are not necessarily the same.

4,060,541

AROMATIC CYANIC ACID ESTERS

Rudolf Sundermann, Leverkusen, Germany, assignor to Bayer Aktiengesellschaft, Leverkusen, Germany

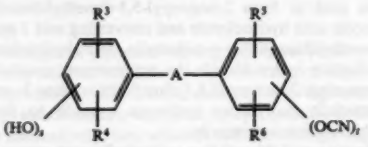
Filed Feb. 5, 1976, Ser. No. 655,362

Claims priority, application Germany, Feb. 22, 1975, 2507746

Int. Cl.² C07C *122/00*

U.S. Cl. 260—453 AR **3 Claims**

1. Aromatic cyanic acid esters of the formula



wherein
R^3, R^4, R^5 and R^6 are the same or different and are hydrogen, halogen or alkyl,
A is a bond between the aromatic rings or divalent alkyl with up to 6 carbon atoms, optionally substituted by lower alkyl, optionally substituted 5-membered or 6-membered cycloaliphatic, sulphonyl ($-SO_2-$) or carbonyl (—CO—),
wherein
s and *t* are the same or different and are one of the numbers from 1 to 5.

4,060,542

14-DESOXY-14 THIOCYANATO-ACETOXY-MUTILIN

Kurt Riedl, Kufstein, Austria, assignor to Biochemie Gesellschaft m.b.H., Vienna, Austria

Division of Ser. No. 416,246, Nov. 15, 1973, Pat. No. 3,979,423, which is a continuation of Ser. No. 261,335, June 9, 1972, abandoned, which is a continuation-in-part of Ser. No. 57,761, June 23, 1970, abandoned. This application June 28, 1976, Ser. No. 700,114

Claims priority, application Austria, July 25, 1969, 7223/69

Int. Cl.² C07C *161/02, 161/04*

U.S. Cl. 260—454 **1 Claim**

1. 14-desoxy-14-thiocyanatoacetoxy-mutilin.

4,060,543

MANUFACTURE OF 5-CYANOVALERIC ACID AND ITS ESTERS

Hans-Martin Weitz, Bad Durkheim, and Rolf Fischer, Heidelberg, both of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Germany

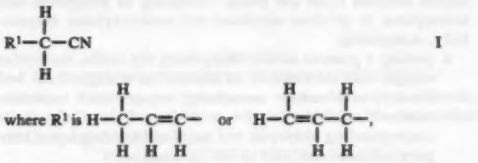
Filed Aug. 2, 1976, Ser. No. 710,427

Claims priority, application Germany, Sept. 18, 1975, 2541640

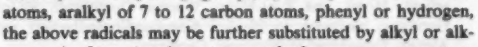
Int. Cl.² C07C *120/00*

U.S. Cl. 260—464 **9 Claims**

1. A process for the manufacture of 5-cyanovaleric acid and its esters by reaction of alkenyl-nitriles with carbon monoxide and hydroxyl-containing compounds at elevated temperature and elevated pressure in the presence of metal carbonyls and basic compounds, said process being carried out by effecting the reaction without adding hydrogen, wherein a pentenonitrile of the formula



is reacted with carbon monoxide and a compound, containing a hydroxyl group, of the formula



where R^2 is alkyl of 1 to 12 carbon atoms which may be substituted by 1 or 2 hydroxyl groups, cycloalkyl of 5 to 7 carbon atoms, aralkyl of 7 to 12 carbon atoms, phenyl or hydrogen, the above radicals may be further substituted by alkyl or alkoxy each of 1 to 4 carbon atoms, or hydroxy, at a temperature of from 140° to 300° C and a pressure of from 100 to 700 bars, in the presence of pure carbonyls and/or carbonyls of which the carbon monoxide is partially replaced by neutral or charged ligands and/or carbonyl hydrides of iridium, iron, nickel, ruthenium, rhodium and/or cobalt and basic heterocyclic compounds, said basic heterocyclic compound being a 5-membered or 6-membered nitrogen-containing ring which is unsubstituted or substituted by alkyl or alkoxy each of 1 to 4 carbon atoms, or hydroxyl, to each of which rings one or 2 aromatic nuclei, which may be substituted by the above substituents, may be fused.

4,060,544

N-2-[N-(KETO-TERT-ALKYL CARBAMYL)ALKYL]PHENYLAMINES

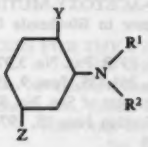
Lester N. Stanley, Delmar, and Russell E. Farris, Elnora, both of N.Y., assignors to GAF Corporation, New York, N.Y.

Division of Ser. No. 319,034, Dec. 27, 1972, Pat. No. 3,931,145. This application Aug. 18, 1975, Ser. No. 605,265

Int. Cl.[2] C07C *69/02, 103/20, 121/50*

U.S. Cl. 260—465 D 2 Claims

1. A compound of the formula



wherein

Z is hydrogen, halo, lower alkyl, or NHX;

X is SO_2R, SO_2OR, COR or COOR;

R is hydrogen, lower alkyl or phenyl;

Y is hydrogen, lower alkyl or lower alkoxy;

R^1 is $—C_2H_4CONHC(CH_3)_2CH_2COCH_3$; and

R^2 is R^1, lower alkyl, lower alkenyl, lower alkynyl or lower alkyl, lower alkenyl or alkynyl substituted with chlorine, bromine, fluorine, hydroxy, cyano, thiocyano, lower alkoxy, hydroxyethoxy, lower alkoxycarbonyl, lower alkanoyloxy, benzoyloxy, unsubstituted carbamyl, or carbamyl N-mono- or N,N-di-substituted with lower alkyl.

4,060,545

PREPARATION OF UNSATURATED CARBOXYLIC ESTERS FROM PROPYLENE OR ISOBUTYLENE

Arthur F. Miller, Lyndhurst; Robert J. Zagata, Seven Hills, and Robert K. Grasselli, Chagrin Falls, all of Ohio, assignors to The Standard Oil Company, Cleveland, Ohio

Filed May 28, 1976, Ser. No. 691,052

Int. Cl.[2] C07C *69/54*

U.S. Cl. 560—208 11 Claims

1. A process for the oxidative esterification of unsaturated olefins selected from the group consisting of propylene and isobutylene, to produce acrylates and methacrylates, respectfully, comprising:

a. passing a gaseous stream comprising the olefin, molecular oxygen and ethylene or an alcohol to a single fluid bed reactor, said reactor containing one or more oxidation catalysts effective for the oxidation of the olefin to its corresponding aldehyde and acid, and operated at a temperature between 200° to 600° C., and

b. collecting the acrylates or methacrylates in the reactor effluent.

4,060,546

PROCESS FOR THE MANUFACTURE OF ACYLATION PRODUCTS OF PHOSPHOROUS ACID

Bruno Blaser, Dusseldorf-Urdelbach; Hans-Günther Germscheid, Hosel, and Karl-Heinz Worms, Dusseldorf, all of Germany, assignors to Henkel Kommanditgesellschaft auf Aktien, Dusseldorf-Holthausen, Germany

Continuation of Ser. No. 703,789, Feb. 5, 1968, abandoned, which is a continuation of Ser. No. 446,742, March 8, 1965, abandoned, which is a continuation-in-part of Ser. No. 159,159, Dec. 13, 1961, abandoned. This application Sept. 25, 1969, Ser. No. 869,437

Claims priority, application Germany, July 3, 1961, 43035

Int. Cl.[2] C07F *9/38*

U.S. Cl. 260—502.4 A 10 Claims

1. A process for the manufacture of acylation products of a phosphorous acid having at least two phosphorus atoms in their molecules, which consists essentially of the steps of mixing one mol of phosphorus trichloride with from 2.5 to 3 mols of a mixture of carboxylic acid plus water, said acid being selected from the group consisting of an aliphatic monocarboxylic acid having 2 to 12 carbon atoms and benzoic acid; the share of said water in said mixture being from 1.2 to 1.5 mols; at a temperature up to 80° C; heating the reaction blend thus obtained, after completing of said mixing to 100° C to 160° C and recovering said acylation products.

4,060,547

PRODUCTION OF DICARBOXYLIC ACIDS

Frank E. Paulik, Houston, Tex.; Arnold Hershman, Creve Coeur, Mo.; Walter R. Knox, Town and Country, Mo., and James F. Roth, Creve Coeur, Mo., assignors to Monsanto Company, St. Louis, Mo.

Continuation of Ser. No. 752,762, Aug. 15, 1968, abandoned, which is a continuation-in-part of Ser. No. 628,581, April 5, 1967, abandoned. This application Jan. 22, 1973, Ser. No. 325,291

The portion of the term of this patent subsequent to Oct. 30, 1990, has been disclaimed.

Int. Cl.[2] C07C *51/12, 51/14*

U.S. Cl. 260—532 21 Claims

1. A process for the carbonylation of reactants selected from the group consisting of tetrahydrofuran and non-vicinal acyclic glycols wherein the hydroxyl groups are on different carbon atoms and there are from 3 to 20 carbon atoms in the glycol, said process comprising contacting

1. at least one of said reactants,
2. carbon monoxide, and
3. a catalyst system consisting essentially of

a. a metal compound selected from the group consisting of rhodium compounds, and iridium compounds and

b. a halogen component which is bromine, iodine, a bromide compound or an iodide compound, wherein during said contacting, said metal compound and said halogen component are present in an amount sufficient to catalyze the carbonylation of said reactants, said contacting being carried out at a temperature in the range of 125° C to 250° C.

4,060,548

PROCESS OF MAKING PENICILLAMINE

Friedrich Asinger, Aachen; Heribert Offermanns, Grossauheim, and Miklos Ghyczy, Laurensberg, all of Germany, assignors to Deutsche Gold- und Silber-Scheideanstalt Vormals Roessler, Frankfurt, Germany

Division of Ser. No. 346,825, March 29, 1973, Pat. No. 3,948,984, and a continuation-in-part of Ser. No. 862,148, Sept. 4, 1969, abandoned. This application Dec. 19, 1975, Ser. No. 642,572

Claims priority, application Germany, Sept. 6, 1968, 1795297

The portion of the term of this patent subsequent to Apr. 6, 1993, has been disclaimed.

Int. Cl.[2] C07C *99/10*

U.S. Cl. 260—534 S 10 Claims

1. In a process for the production of D,L-penicillamine or its hydrochloride by reacting 2-isopropyl-5,5-dimethylthiazoline-3 with hydrogen cyanide to form 2-isopropyl-5,5-dimethylthiazoline-4-carbonitrile, hydrolysis of the nitrile with hydrochloric acid to form 2-isopropyl-5,5-dimethylthiazolidine-4-carboxylic acid hydrocloride and converting said 2-isopropyl-5,5-dimethylthiazolidine-4-carboxylic acid hydrochloride to penicillamine hydrochloride the improvement consisting of:

a. reacting 2-isopropyl-5,5-dimethylthiazoline-3 with substantially anhydrous hydrogen cyanide to form said thiazolidine carbonitrile,

b. heating said thiazolidine carbonitrile with excess concentrated hydrochloric acid at a temperature between about 70° C. and 110° C. to form said thiazolidine carboxylic acid hydrochloride, and,

c. converting said thiazolidine carboxylic acid hydrochlo-

V964/5 NO297 7 UMI

ride to penicillamine hydrochloride by subjecting it to a steam distillation.

4,060,549

PROCESS FOR PREPARING SULFONIC ACID FLUORIDES

Arthur H. Schmidt, Wiesbaden; Reinhard Lantzsch, Cologne; Albrecht Marhold, Leverkusen; Klaus-Friedrich Lehment, Odenthal, and Adolf Staffe, Leverkusen, all of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany

Filed Mar. 4, 1976, Ser. No. 663,881

Claims priority, application Germany, Mar. 21, 1975, 2512498

Int. Cl.² C07C *143/70, 139/00*

U.S. Cl. 260—543 F 10 Claims

1. In a process for preparing sulfonic acid fluorides by reacting sulfonic acid halides with inorganic fluorides in an organic aqueous phase, the improvement comprising carrying out the reaction of a sulfonic acid halide having the structure

$$R—SO_2—X$$

in which

X is bromine or chlorine and

R is a straight-chain, branched or cyclic hydrocarbon radical of 1–28 C atoms which can simultaneously contain chain and cyclic structural elements, saturated, unsaturated or aromatic, which can be further substituted by —SO_2X—groups, fluorine, chlorine, bromine, iodine, oxygen, sulphur, nitrogen and/or phosphorus, one or more of which being arranged in and/or on a ring or in and/or on a chain

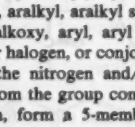
with an inorganic fluoride in a water immiscible inert organic solvent in the presence of a catalytic amount of an amine having the structure

I

in which

R_1, R_2, and R_3 are independently selected from the group consisting of alkyl, alkyl substituted by hydroxy or lower alkoxy, alkenyl, cycloalkyl, cycloalkyl substituted by hydroxy or alkyl, aralkyl, aralkyl substituted by halogen, alkyl or lower alkoxy, aryl, aryl substituted by lower alkyl, methoxy or halogen, or conjointly R_1, R_2 and/or R_3 combined with the nitrogen and/or additional heteroatoms selected from the group consisting of oxygen, sulphur or nitrogen, form a 5-membered or 6-membered heterocyclic structure,

or in the presence of a catalytic amount of an onium salt having the formula



in which

L is nitrogen or phosphorous; R_4, R_5, R_6 and R_7 are independently selected from the group consisting of alkyl, aralkyl substituted by C_1–C_4 alkyl, methoxy or halogen, aryl, and aryl substituted by C_1–C_4 alkyl, C_1–C_2 alkoxy or halogen, or alternatively, two adjacent radicals amongst R_4, R_5, R_6 and R_7 and including the central atom L, form a 5 or 6-membered heterocyclic structure which can additionally contain a further hetero atom selected from the group consisting of oxygen, sulfur or nitrogen; and X^- is a halide, cyanide or hydroxyl ion.

4,060,550

NOVEL N'-ACYLATED PHENYL-HYDRAZINE AND -HYDRAZONE DERIVATIVES

Michio Kimura, Minoo; Shigeho Inaba, Takarazuka, and Hisao Yamamoto, Nishinomiya, all of Japan, assignors to Sumitomo Chemical Company, Limited, Japan

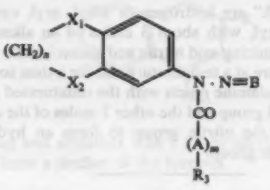
Division of Ser. No. 439,035, Feb. 4, 1974, Pat. No. 3,974,145, which is a division of Ser. No. 173,700, Aug. 20, 1971, Pat. No. 3,812,112. This application Jan. 23, 1976, Ser. No. 651,831

Claims priority, application Japan, Aug. 26, 1970, 45-75198; Dec. 9, 1970, 45-109769; Dec. 9, 1970, 45-109771; Feb. 15, 1971, 46-6887; Feb. 16, 1971, 46-7492; Aug. 27, 1970, 45-75818

Int. Cl.² C07C *103/133*

U.S. Cl. 260—340.5 R 10 Claims

1. A compound of the formula,



(II)

wherein X_1 and X_2 are each methylene; A is an unsubstituted ethylenically unsaturated hydrocarbon chain having up to 5 carbon atoms, m is 0 or 1; n is 1 or 2; R_3 is alkyl having up to 4 carbon atoms, cycloalkyl having 3 to 7 carbon atoms, unsubstituted or C_1–C_4 alkyl-, nitro-, trifluoromethyl-, methylenedioxy-, ethylenedioxy- or halogen-substituted phenyl, or halogen-, C_1–C_4 alkyl- or phenyl-substituted or benzene ring-condensed C_3–C_7 cycloalkyl, or unsubstituted or halogen-, C_1–C_4 alkyl- or phenyl-substituted or benzene ring-condensed C_5–C_6 cycloalkenyl; and B is

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4,060,551

METHOD OF PRODUCING PANTETHINE

Saburo Uchikuga, Yokohama, and Masataka Kuroki, Sagamihara, both of Japan, assignors to Sogo Pharmaceutical Company Limited, Japan

Filed Aug. 10, 1976, Ser. No. 713,282

Claims priority, application Japan, May 25, 1976, 51-059679

Int. Cl.² C07C *149/23*

U.S. Cl. 260—561 S 12 Claims

1. A method of producing pantethine comprising reacting a salt of pantothenic acid and a salt of cystamine in the presence of a carbodiimide and an N-hydroxy compound selected from the group consisting of 1-hydroxybenzotriazole and N-hydroxysuccinimide.

4,060,552

PREPARATION OF N,N'-di-2-NAPHTHYL-p-PHENYLENEDIAMINE

George Kletecka, Rocky River, Ohio, assignor to The B. F. Goodrich Company, Akron, Ohio

Filed Dec. 12, 1975, Ser. No. 640,053

Int. Cl.² C07C *87/64*

U.S. Cl. 260—576 7 Claims

1. In a process for reacting β-naphthol with p-phenylenediamine to form N,N'-di-2-naphthyl-p-phenylenediamine the improvement which comprises including a boric oxide in the reaction.

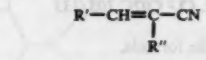
4,060,553

HYDROXYALKYLAMINOALKYLAMIDES AND PREPARATION AND USES THEREOF

Derek Redmore, Ballwin, and Benjamin T. Outlaw, Webster Groves, both of Mo., assignors to Petrolite Corporation, St. Louis, Mo.

Filed May 10, 1976, Ser. No. 684,711
Int. Cl.[2] C07C *103/29, 103/183*
U.S. Cl. 260—559 A 10 Claims

1. A process of reacting about 1 mole of an unsaturated nitrile of the formula



wherein R′ and R″ are hydrogen or alkyl, aryl, cycloalkyl, alkaryl, and aralkyl, with about 3 moles of an alkanolamine which comprises mixing said nitrile and alkanolamine and then heating said mixture at a temperature and for a time so that one mole of the alkanolamine reacts with the unsaturated group to form an N-alkanol group and the other 2 moles of the alkanolamine react with the nitrile group to form an hydroxyalkylaminoalkylamide group.

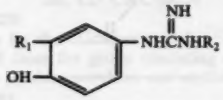
4,060,554

SUBSTITUTED 4-HYDROXYPHENYL GUANIDINES

Robert Chung-Huan Liu, and John Lawrence Hughes, both of Kankakee, Ill., assignors to Armour Pharmaceutical Company, Phoenix, Ariz.

Division of Ser. No. 518,925, Oct. 29, 1974, Pat. No. 4,014,934, which is a continuation-in-part of Ser. No. 460,815, April 15, 1974, Pat. No. 3,908,013, which is a division of Ser. No. 73,244, Sept. 17, 1970, abandoned. This application Jan. 25, 1977, Ser. No. 762,359
Int. Cl.[2] C07C *129/08*
U.S. Cl. 260—565 2 Claims

1. Aromatic quanidine compounds having the formula



wherein: R_1 is hydroxymethyl; and R_2 is hydrogen or methyl.

4,060,555

PROCESS FOR THE PRODUCTION OF CHLOROFLUORINATED ALIPHATIC KETONES

James Oliver Peterson, Sayder; Bernard Sukornick, Williamsville; Richard Francis Sweeney, Elma; Henry R. Nychka, East Aurora; Richard E. Eibeck, Orchard Park, all of N.Y., and Morris B. Berenbaum, Summit, N.J., assignors to Allied Chemical Corporation, Morris Township, N.J.

Filed Dec. 22, 1975, Ser. No. 642,832
Int. Cl.[2] C07C *49/30, 49/04*
U.S. Cl. 260—586 R 47 Claims

1. The process for the production of chlorofluorinated ketones by the oxychlorofluorination of ketones which comprises reacting a gaseous mixture of a starting material selected from an acyclic or cyclic saturated aliphatic ketone containing only C, H and O atoms and halogenated derivatives thereof in which one or more hydrogen atoms but not all are replaced with halogen atoms selected from chlorine and fluorine, or mixtures thereof, at least .25 mole oxygen in an oxygen-containing gas per C—H bond in the starting material, at least 0.25 mole HCl or equivalent of Cl_2 for each C—H bond present in the starting material, and HF, in the presence of a Deacon catalyst supported by a stable, inert metal salt carrier, with the weight percentage of cation in the Deacon catalyst ranging from about 0.6–20 based on the total cation content of the Deacon catalyst and metal salt carrier, at elevated temperatures and with a contact time of about 1.—20 seconds.

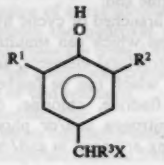
4,060,556

PREPARATION OF ANTIOXIDANTS

Dane K. Parker, Canton, Ohio, assignor to The Goodyear Tire & Rubber Company, Akron, Ohio

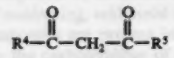
Division of Ser. No. 435,569, Jan. 22, 1974, Pat. No. 3,989,741. This application Dec. 11, 1975, Ser. No. 639,665
Int. Cl.[2] C07C *49/82*
U.S. Cl. 260—590 R 3 Claims

1. A process comprising reacting compounds having the general structural formula, about one mole



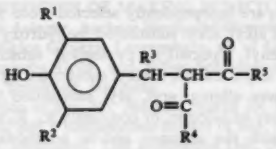
(I)

with compounds having the general formula



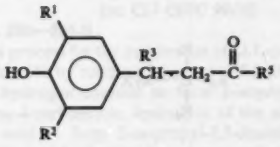
(II)

reacting in the presence of a basic catalyst while dissolved in ethanol solvent to yield a monoalkylated diketone having the structural formula



(III)

which under reflux in ethanol solvent forms a compound having the general structural formula



(IV)

wherein in said formulas R^1 and R^2 are the same or different radicals selected from the group consisting of tertiary alkyl radicals having from 4 to 12 carbon atoms, R^3 is selected from the group consisting of hydrogen and n-alkyl radicals having from 1 to 20 carbon atoms and X is selected from the group consisting of chloro, bromo and iodo, R^4 and R^5 are the same or different radicals selected from the group consisting of alkyl radicals having from 1 to 10 carbon atoms, alkylene radicals having from 2 to 10 carbon atoms, and aryl radicals having from 6 to 12 carbon atoms.

4,060,557

HYDROFORMYLATION

Anthony Macaluso, Sr., Port Arthur, and Lawrence F. Kuntschik, Nederland, both of Tex., assignors to Texaco Inc., New York, N.Y.

Continuation-in-part of Ser. No. 366,387, June 4, 1973, abandoned. This application June 19, 1975, Ser. No. 588,534
Int. Cl.[2] C07C *45/08*
U.S. Cl. 260—604 HF 7 Claims

1. In a process for the production of aldehydes and alcohols by contacting olefins of the group of C_{11}–C_{14} alpha olefins with carbon monoxide and hydrogen in a hydroformylation zone at a temperature of about 100° to about 300° C. under a pressure of 1 to 200 psig in the presence of a cobalt catalyst consisting of cobalt in complex combination with carbon monoxide and a tertiary organo-phosphine to form a product phase containing unreacted olefins, paraffins, saturated aldehydes and alcohols, catalyst residue and heavy end; which are separated, the improvement whereby said separation is effected by the steps of metering said phase to a thin film evaporating zone, mechanically forming a thin film of said phase on a heated surface; continuously wiping said film on said surface at a temperature range of 200° to 250° C for an exposure time for said residue of 5 to 55 seconds thereby separating a distillate containing unreacted olefins, paraffins, aldehydes and alcohols, from said catalyst residue and heavy end; fractionating said distillate to separate the components thereof and directly recycling at least a part of said residue to said hydroformylation zone.

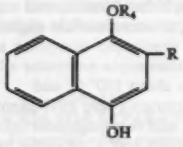
4,060,558

PROCESS FOR PREPARING 3-ALKYL-4-ALKOXY-1-NAPHTHOLS

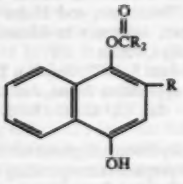
Henry Rapoport, Berkeley, and Clinton D. Snyder, Monte Sereno, both of Calif., assignors to The Regents of the University of California, Berkeley, Calif.

Division of Ser. No. 565,472, April 7, 1975, Pat. No. 3,948,958. This application Oct. 7, 1975, Ser. No. 620,288
Int. Cl.[2] C07C *41/00*
U.S. Cl. 260—613 D 4 Claims

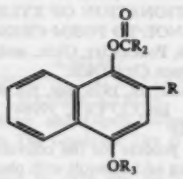
1. A method of preparing 1-naphthol of the formula



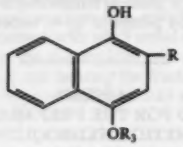
wherein R is lower alkyl and R_4 is lower alkyl, comprising alkylating with a benzyl halide alkylating agent of 7 to about 10 carbon atoms 1-acylated-1,4-naphthoquinol of the formula



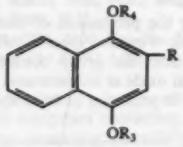
wherein R_2 is lower alkyl to produce ether-ester of the formula



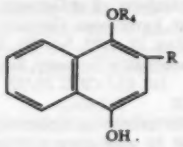
wherein R_3 is a benzyl of 7 to about 10 carbon atoms, hydrolyzing said ether-ester to naphthol of the formula



, alkylating said naphthol with a lower alkyl halide alkylating agent to form a diether of the formula



, and hydrogenolyzing said diether at a temperature of about 15° to 100° C. in the presence of a platinum group metal catalyst to form the corresponding 1-naphthol of the formula



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4,060,559

PROCESS FOR PREPARING O-PHENYLPHENOL

Hideo Goto; Nobuyori Shibamoto, and Shunsaku Tanaka, all of Wakayama, Japan, assignors to Sugai Chemical Industry Co., Ltd., Wakayama, Japan

Filed May 3, 1976, Ser. No. 682,524
Claims priority, application Japan, May 14, 1975, 50-57806; May 12, 1975, 50-56272
Int. Cl.[2] C07C *37/06*
U.S. Cl. 260—620 7 Claims

1. A process for preparing o-phenylphenol by dehydrogenating at least one of cyclohexanone dimer and o-cyclohexylphenol in the presence of a catalyst, characterized in that the catalyst consists essentially of a metal oxide carrier, and about 0.1 to about 10% by weight based on the carrier of at least one of alkali metal salts of sulfur-oxygen acids and 0.1 to 3.0% by weight based on the carrier of at least one of platinum and palladium supported by the carrier.

4,060,560

DISPROPORTIONATION OF XYLENOLS WITH PHENOL TO FORM CRESOLS

Bruce Eugene Leach, Ponca City, Okla., assignor to Continental Oil Company, Ponca City, Okla.

Filed Mar. 26, 1976, Ser. No. 670,772
Int. Cl.² C07C 39/04
U.S. Cl. 260—621 D 8 Claims

1. An improved process for the conversion of xylenols to cresols by contacting said xylenols with phenol in the presence of magnesium oxide catalysts, the improvement comprising promoting the catalytic activity and catalyst life of magnesium oxide by adding a promotor selected from the group consisting of tungsten oxide or uranium oxide while carrying out the reaction in the vapor phase at temperatures of from about 350° to about 550° C and pressures up to about 1,000 pounds per square inch gauge.

4,060,561

METHOD FOR THE PREPARATION OF TRIMETHYLHYDROQUINONE

Charles M. Starks, Ponca City, Okla., assignor to Continental Oil Company, Ponca City, Okla.

Filed Sept. 20, 1976, Ser. No. 724,788
Int. Cl.² C07C 39/08
U.S. Cl. 260—621 F 11 Claims

1. A method for the production of trimethyhydroquinone comprising reacting 4-methoxyphenol with methanol over catalysts selected from the group consisting of magnesium oxide and aluminum oxide at temperatures of from about 350° C to about 550° C at pressures of from about atmospheric to about 1,000 psig.

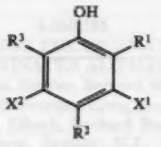
4,060,562

PROCESS FOR PREPARING META-SUBSTITUTED HALOPHENOLS

Karlfried Wedemeyer, Cologne; Wolfgang Kiel, Schildgen, and Werner Evertz, Monheim, all of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany

Filed Aug. 29, 1975, Ser. No. 609,140
Claims priority, application Germany, Sept. 10, 1974, 2443152
Int. Cl.² C07C 39/30
U.S. Cl. 260—623 R 11 Claims

1. In a process for preparing a phenol which is meta-substituted by halogen by contacting a halogen phenol of the formula



wherein

X^1 and X^2 are identical or different and represent halogen, hydrogen, aryl selected from the group consisting of phenyl, naphthyl and aralkyl wherein the aralkyl group has 7 to 18 carbon atoms of which the alkyl portion has up to 6 carbon atoms, substituted aryl or substituted aralkyl wherein the substituent is selected from the group consisting of hydroxyl, halogen, alkyl having 1 to 6 carbon atoms, cycloalkyl having 5 to 6 carbon atoms, with at least one of the radicals X^1 or X^2 representing a halogen, and

R^1, R^2 and R^3 are identical or different and represent hydrogen, aryl selected from the group consisting of phenyl, naphthyl and aralkyl having 7 to 18 carbon atoms of which the alkyl portion has up to 6 carbon atoms, substituted aryl or aralkyl wherein the substituent is a hydroxyl group, halogen, an alkyl group having 1 to 6 carbon atoms, a cycloalkyl group having 5 or 6 carbon atoms, chlorine, bromine or iodine, with at least one of the radicals R^1, R^2, and R^3 representing chlorine, bromine or iodine,

with hydrogen under a pressure of 20 to 250 atmospheres at an elevated temperature of 100° to 350° C in the presence of a catalyst, the improvement which comprises employing as the catalyst a catalyst consisting essentially of elemental sulfur, an inorganic sulfur compound selected from the group consisting of hydrogen sulfide, a sulfide or polysulfide or an alkyali metal or alkaline earth metal, or an organic sulfur compound selected from the group consisting of carbon disulfide, carbon oxysulfide, thiocarbonic acid ethyl ester, a xanthic acid derivative, a thiourethane, thiourea, a thiocarbonic acid or its derivative, a thioaldehyde, a thiol, a thiophenol, a thioalkane, thioaxane, dithiane, disulfide and a thioketone.

4,060,563

PROCESS FOR PREPARING 2-ALLYL PHENOL

Delmar Frederick Lohr, Jr., Akron, Ohio, and Lynn Burritt Wakefield, Milwaukee, Oreg., assignors to The Firestone Tire & Rubber Company, Akron, Ohio

Filed Oct. 18, 1976, Ser. No. 733,612
Int. Cl.² C07C 39/20
U.S. Cl. 260—624 B 4 Claims

1. A process for preparing 2-allyl phenol from phenol comprising, the sequential steps of:

a. reacting in situ a compound selected from the class consisting of an alkali metal hydroxide with the phenol to form an alkali phenoxide, the amount of said alkali metal hydroxide to said phenol ranging from about 1.0 to about 1.5 on an equivalent basis,

b. carrying out said in situ reaction in a water miscible polar solvent, said polar solvent selected from the class consisting of alcohols having from 1 to about 6 carbon atoms and diols having from 2 to about 4 carbon atoms,

c. reacting said alkali phenoxide with allyl chloride in said polar solvent to form an allyl phenyl ether mixture containing various by-products,

d. reacting said alkali metal phenoxide with said allyl chloride under autogenous pressure at a temperature of from about 20° C to about 100° C, the amount of said allyl chloride to said alkali phenoxide ranging from about 1.1 to about 1.5 equivalents,

e. washing said allyl phenyl ether mixture with water,

f. adding to said allyl phenyl ether mixture a non-polar hydrocarbon azeotropic solvent, said non-polar solvent being an aromatic having from 6 to 12 carbon atoms,

g. azeotropically distilling off said non-polar hydrocarbon solvent and said various reaction by-products so that only said allyl phenyl ether remains, said azeotropically distillation occurring at a temperature slightly below the boiling point of said azeotropic non-polar solvent, the boiling point of said azeotropic non-polar solvent ranging from about 70° C to about 140° C, and

h. thermally rearranging said allyl phenyl ether to produce 2-allyl phenol, said rearrangement occurring at a temperature of from about 160° C to about 240° C.

4,060,564

PROCESS FOR PREPARING ALCOHOLS

Muneaki Kanemaru, Yokohama; Tetsuo Kimura, Kamakura; Norimichi Ishii, Yokohama, and Hideo Kawashima, Kamakura, all of Japan, assignors to Mitsui Toatsu Chemicals, Incorporated, Tokyo, Japan

Filed Jan. 5, 1977, Ser. No. 757,023
Claims priority, application Japan, Jan. 21, 1976, 51-515043
Int. Cl.² C07C 29/08
U.S. Cl. 260—641 8 Claims

1. A process for hydrating aliphatic olefins having from 2 to 12 carbon atoms to prepare corresponding alcohols comprising contacting said aliphatic olefins with an aqueous 0.1 to 20.0 wt % phosphoric acid solution containing a compound selected from oxyacids of chromium and salts thereof in an amount of

V 9 6 4 / 5 N 0 2 9 7 7 UMI

from 0.001 to 1.0 wt % of the reaction solution at a temperature of from 100° to 350° C under a pressure of from 10 to 350 kg/cm²(G) under which the reaction solution is maintained in a liquid state.

4,060,565

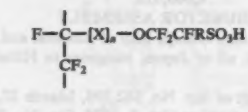
HYDROCARBON CONVERSION PROCESS USING A SUPPORTED PERFLUORINATED POLYMER CATALYST

James D. McClure, and Stanley G. Brandenberger, both of Houston, Tex., assignors to Shell Oil Company, Houston, Tex.

Division of Ser. No. 663,956, March 4, 1976, Pat. No. 4,038,213. This application Apr. 1, 1977, Ser. No. 783,917
Int. Cl.² C07C 3/54
U.S. Cl. 260—671 C 6 Claims

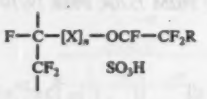
1. A liquid phase process for the preparation of ethylbenzene which conprises contacting an ethylene feed stream with a benzene feed stream at a reaction temperature of between about 125° C and about 225° C in the presence of a catalyst composition comprising a solid perfluorinated polymer catalyst supported on an inert porous carrier having an average pore diameter of between about 50 A and about 600 A in a weight ratio of catalyst to support of between about 0.1:100 and about 20:100 wherein said catalyst contains a repeating structure selected from the group of:

a)



or

b)



where n is 0, 1 or 2; R is a radical selected from the group consisting of fluorine and perfluorealkyl radicals having from 1 to 10 carbon atoms; and X is selected from the group consisting of:

$[O(CF_2)_m]$, $[OCF_2CFY]$ or $[OCFYCF_2]$

where m is an integer from 2 to 10 and Y is a radical selected from the class consisting of fluorine and trifluoromethyl radical.

4,060,566

MEMBRANE PROCESS FOR SEPARATING MATERIALS

Robert L. Yahnke, Naperville, Ill., assignor to Standard Oil Company (Indiana), Chicago, Ill.

Filed Nov. 19, 1975, Ser. No. 633,258
Int. Cl.² C07C 11/04
U.S. Cl. 260—677 A 26 Claims

1. A process for separating a material from a fluid mixture comprising contacting said mixture containing said material with a first side of an essentially solid, water-insoluble, semi-permeable membrane having in contact therewith an aqueous liquid barrier having metal-containing ion which combine with said material to form a water-soluble complex, the partial pressure of said material on a second side of the semi-permeable membrane being sufficiently less than the partial pressure of said material on said first side to provide separated material on the second side of the semi-permeable membrane, and removing said separated material from the vicinity of the second side of the semi-permeable membrane, wherein the total pressure on the second side is about 75 to 125% of the total pressure of the mixture on the first side, and the latter total pressure is at least about 50 psig.

4,060,567

METHOD OF REDUCING α-ACETYLENE CONTENT OF HYDROCARBON

James J. Tazuma, Stow, and Angelo Bergomi, Akron, both of Ohio, assignors to The Goodyear Tire & Rubber Company, Akron, Ohio

Filed Sept. 10, 1976, Ser. No. 722,189
Int. Cl.² C07C 7/00
U.S. Cl. 260—681.5 C 7 Claims

1. A method of reducing the α-acetylene content of a hydrocarbon fraction which comprises a diolefin containing 4 to 8 carbon atoms and small amounts of α-acetylenes by contacting said hydrocarbon fraction with alkali metal amide dispersed on a support to reduce the α-acetylene content, separating the fraction from support and treating the fraction separated from the support to remove ammonia generated as fraction contacts the alkali metal amide.

4,060,568

SILICA-MODIFIED ZEOLITE CATALYST AND CONVERSION THEREWITH

Paul G. Rodewald, Rocky Hill, N.J., assignor to Mobil Oil Corporation, New York, N.Y.

Filed Mar. 31, 1976, Ser. No. 672,194
Int. Cl.² C07C 1/20, 1/24
U.S. Cl. 260—682 7 Claims

1. A process for producing a hydrocarbon mixture rich in C_2-C_3 olefins which comprises contacting, under conversion conditions, a charge consisting essentially of one or more lower monohydric alcohols having up to four carbon atoms, the ethers derived therefrom or mixtures of said alcohols and ethers with a catalyst composition comprising a crystalline aluminosilicate zeolite having a silica to alumina ratio of at least about 12, a constraint index within the approximate range of 1 to 12 and containing interdispersed within the interior crystalline structure thereof added amorphous silica in an amount of at least about 0.1 weight percent.

4,060,569

HYDROCARBON POLYMERS

John Henry Woods, Tulsa, and Toby R. Graves, Bartlesville, both of Okla., assignors to Petrolite Corporation, St. Louis, Mo.

Filed Dec. 24, 1975, Ser. No. 644,138
Int. Cl.² C07C 3/10
U.S. Cl. 260—683.15 R 39 Claims

1. A process of preparing polymers which have congealing and melting points which are essentially no higher than those of the starting materials, which comprises polymerizing a hydrocarbon starting material consisting primarily of alpha olefins, and which is a solid at room temperature, in the presence of a free radical catalyst under pressures of less than 500 psig but sufficient to keep the reactants and catalysts from vaporizing and at temperatures of about 40° C. to 250° C. for a period of 1 to 20 half-lives of the free radical catalyst, the molar ratio of free radical catalyst to hydrocarbon being from about 0.005 to 0.35.

4,060,570

CURABLE LIQUID POLYSULFIDE POLYMER BASED SEALANTS

Henry Neil Paul, 3rd, Blue Bell, Pa., assignor to Thiokol Corporation, Newtown, Pa.

Filed May 10, 1976, Ser. No. 684,990
Int. Cl.² C08L 9/00, 23/22, 23/20
U.S. Cl. 260—889 23 Claims

1. A polysulfide based sealant composition which comprises:
a. a curable liquid polysulfide polymer of the formula

HS—$(RSS)_n$—RSH wherein R is a hydrocarbon, oxahydrocarbon or thiahydrocarbon radical and *n* is from 4 to about 23;

b. a butyl rubber, a polybutene polymer, or a mixture thereof as an adhesive additive; and

c. an oil absorbent filler.

4,060,571

PRODUCTION OF N,N-BIS-(2-HYDROXYALKYL)-AMINOMETHANE PHOSPHONIC ACID DIALKYL ESTERS

Manfred Kapps, Leverkusen; Karl-Heinz Mitschke, Odenthal, and Reinhard Schliebs, Cologne, all of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany

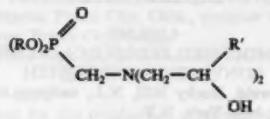
Filed Feb. 6, 1976, Ser. No. 656,034

Claims priority, application Germany, Feb. 15, 1975, 2506442

Int. Cl.² C07F *9/40*

U.S. Cl. 260—970 **5 Claims**

1. A process for the production of N,N-bis(2-hydroxyalkyl)-aminomethane phosphonic acid dialkyl esters of the formula

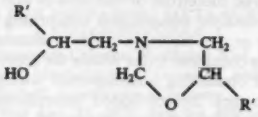


in which

R is an optionally substituted alkyl radical with 2 to 10 carbon atoms, and

R′ is hydrogen or a lower alkyl radical with up to 6 carbon atoms,

comprising reacting an oxazolidine of the formula



with a dialkyl phosphite in the presence of an acid ion exchanger.

4,060,572

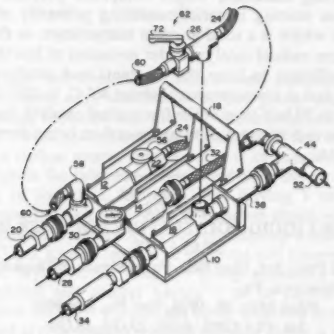
FOAMING APPARATUS

Marcel Widmann, West Hill, Canada, assignor to Borden Products Limited, West Hill, Canada

Continuation of Ser. No. 493,706, July 31, 1974, abandoned. This application Apr. 7, 1976, Ser. No. 674,618

Int. Cl.² B01F *3/04*

U.S. Cl. 261—18 B **6 Claims**



1. Apparatus for producing foam without the aid of beads in the foaming chamber comprising a foaming chamber, a mesh screen disposed in said foaming chamber, a choke of reduced cross-section relative to said foaming chamber disposed at the downstream portion of said foaming chamber which functions in cooperation with said mesh screen to promote mixing of air and foaming agent solution, a first conduit in communication with said foaming chamber for introducing foaming agent solution thereinto, a first valve provided in said first conduit upstream of said foaming chamber, a second conduit in communication with said foaming chamber for introducing air under pressure thereinto, a second valve provided in said second conduit upstream of said foaming chamber, a third conduit connected into said second conduit upstream of said second valve and being in communication with said foaming chamber, a third valve provided in said third conduit upstream of said foaming chamber which serves to purge said chamber of any remaining material when opened, a mixing chamber, a connecting conduit between said mixing chamber and said foaming chamber, an exit conduit leading from said mixing chamber, a fourth conduit in communication with said mixing chamber for introducing a resin solution thereinto and fourth valve provided in said fourth conduit upstream of said mixing chamber.

4,060,573

CARBURETOR ASSEMBLY

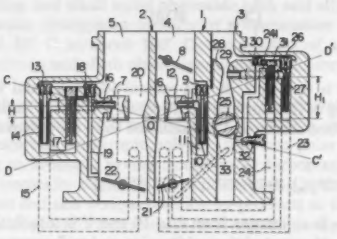
Michitsugu Mori; Mitsuo Ohfuji, both of Katsuta, and Akiyasu Kuwahara, Hitachi, all of Japan, assignors to Hitachi, Ltd., Japan

Continuation-in-part of Ser. No. 562,395, March 27, 1975, abandoned. This application Oct. 5, 1976, Ser. No. 729,701

Claims priority, application Japan, Mar. 29, 1974, 49-34478

Int. Cl.² F02M *13/04*; F02B *19/10*

U.S. Cl. 261—23 B **3 Claims**



1. A carburetor assembly for stratified charge combustion type engines comprising a lean set carburetor consisting of a primary side carburetor and a secondary side carburetor each having a main fuel nozzle for supplying lean fuel-air mixtures to an engine combustion chamber; a rich set carburetor having a main fuel nozzle for supplying rich fuel-air mixtures to said engine combustion chamber, said rich set carburetor being disposed adjacent said primary side carburetor of said lean set carburetor and formed integrally therewith; said primary side carburetor, said secondary side carburetor and said rich set carburetor being arranged such that a substantially straight line connects together the center of an inlet bore of each carburetor as seen from above; and a float chamber for supplying fuel to said rich set carburetor and said lean set carburetor, said float chamber being arranged such that the center of its inclination is disposed in the vicinity of the center line between the main fuel nozzles of said primary side carburetor and said secondary side carburetor, and an open end of the main fuel nozzle of said rich set carburetor being disposed at a level higher than open ends of the main fuel nozzles of said primary side carburetor and said secondary side carburetor of said lean set carburetor.

V 9 6 4 / 5 N 0 2 9 7 7 UMI

4,060,574
DEVICE FOR LAKE RESTORATION BY OXYGEN-ENRICHING OF THE WATER

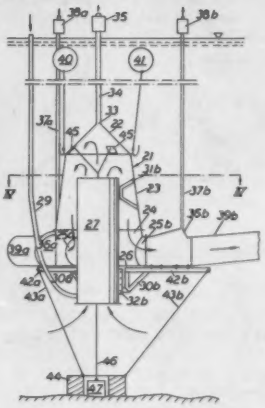
Bo Leonart Verner, Stockholm, and Lars Borje Staffan Fors, Ingaro, both of Sweden, assignors to Atlas Copco Aktiebolag, Nacka, Sweden

Continuation of Ser. No. 258,546, June 1, 1972, abandoned. This application Feb. 21, 1975, Ser. No. 551,930

Claims priority, application Sweden, June 1, 1971, 7002/71; Jan. 28, 1972, 972/72

Int. Cl.[2] B01F *3/04*

U.S. Cl. 261—77 3 Claims



1. Apparatus for oxygenating a thermally stratified body of water having an upper warmer and relatively oxygen-rich epilimnion and a lower colder and relatively oxygen-poor hypolimnion without destratification thereof, which apparatus comprises:

a. an upwardly extending open ended shell located in the hypolimnion;

b. means for introducing pressurized oxygen-containing gas into the lower end of said shell to propel by gas lift pump action a column of water upwardly within said shell whereby to increase the oxygen concentration of said column of water;

c. entrapment means located in the hypolimnion above said shell for entrapping a volume of undissolved gas;

d. passage means for passing the oxygen-enriched water downwardly from over the top of said shell;

e. controlled means for venting entrapped undissolved gas from said entrapment means to the atmosphere to maintain said volume of undissolved gas under a predetermined pressure effective to cause the oxygen-enriched water to flow downwardly in said passage means;

f. outlet means for receiving the downwardly flowing oxygen-enriched water and introducing it into the hypolimnion; and

g. secondary bulged venting means connected to said outlet means for removing residual undissolved gas to the atmosphere.

4,060,575
COOLING TOWER AND WALL STRUCTURE THEREFOR

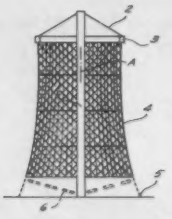
Kurt Uhlirsch, and Hermann Lindhuber, both of Braunau, Austria, assignors to Vereinigte Metallwerke Ranshofen-Berndorf Aktiengesellschaft, Ranshofen near Braunau, Austria

Filed Feb. 14, 1975, Ser. No. 550,014

Claims priority, application Austria, Feb. 15, 1974, 1252/74; Feb. 15, 1974, 1253/74

Int. Cl.[2] B01F *3/04*

U.S. Cl. 261—111 3 Claims



1. In a cooling tower having an upwardly open chimney for inducing a flow of air therethrough and provided with means for supplying a cooling liquid thereto, a structure forming said chimney, said structure comprising:

an upright post defining an axis;

a horizontal upper ring suspended from said post and centered on said axis;

an array of cables hanging from said ring and defining thereunder a generally hyperboloidal surface centered on said axis, said cables crossing one another at intersections;

a plurality of clips each secured to said cables at a respective intersection;

a plurality of metal plates having vertical corrugations of generally trapezoidal section; and

respective rigid stringers each secured to a plurality of said clips and extending across the width of each of said plates and fastened thereto, said stringers securing each plate to said array by said clips so that each plate lies on said surface with its corrugations horizontally spread to greater and lesser extent at different vertical regions along the plate.

4,060,576
METHOD AND APPARATUS FOR VAPOR SATURATED GAS DELIVERY

Graham Cameron Grant, 205 Wigram Road, Glebe, N.S.W. 2037, Australia

Continuation of Ser. No. 396,032, Sept. 10, 1973, abandoned. This application Sept. 8, 1975, Ser. No. 611,382

Claims priority, application Australia, Sept. 13, 1972, 0427; Nov. 17, 1972, 1267

Int. Cl.[2] A61M *15/00*; B01F *15/06*

U.S. Cl. 261—130 7 Claims

1. Gas conditioning apparatus, comprising:

a gas humidifier including means defining a water evaporation chamber in said humidifier;

first heating means for heating water in said evaporation chamber;

a presettable temperature controller for controlling said first heating means to control the water temperature in said chamber;

a gas delivery line extending between said gas humidifier and a delivery point;

a second heater associated with and extending along substantially the entire length of said delivery line;

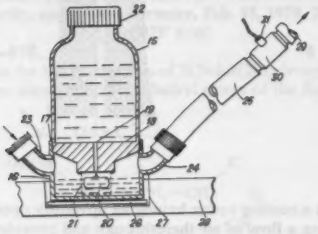
a temperature sensor detecting the temperature of gas leaving the delivery line; and,

a variable temperature controller responsive to said temper-

ature sensor and controlling the secondary heater to alter the heat applied thereby to gas flowing through said line, said first heating means heating said gas in said humidifier to a temperature T_1 and a vapour level W_1 of significantly less than 100% saturation and the variable temperature controller operating independently to maintain the gas temperature at the delivery point at a second temperature T_2, lower than T_1, with a selected vapour level W_2 which is higher than W_1.

7. A method for humidifying and heating gas to be breathed by a patient undergoing anaesthesia, artificial respiration, or the like, comprising:

passing said gas into a humidification tank containing humidifying liquid;



heating the humidifying liquid in said humidification tank thereby heating said gas in the humidification tank to a temperature above a temperature at which it is to be breathed by the patient and humidifying said gas to a humidity of up to 85% with vapor from the humidifying liquid in said tank;

transferring said gas from said humidification tank to a delivery point via a heated delivery line;

sensing the temperature of gas passing from said delivery line; and

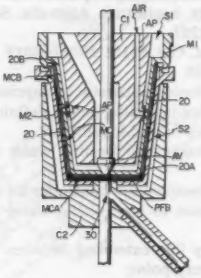
controlling automatically the amount of heat supplied to said gas in said delivery line in accordance with the temperature of gas passing from said delivery line so that said gas passes from said delivery line at about normal body temperature and about 100% relative humidity.

4,060,577

METHOD FOR PRODUCING SEAMLESS FOAM PLASTIC CUPS FROM EXPANDABLE SIDEWALL BLANKS

Richard D. Collins, Timonium, Md., assignor to Maryland Cup Corporation, Owings Mills, Md.

Filed Feb. 11, 1976, Ser. No. 657,184
Int. Cl.² B29D *27/00*
U.S. Cl. 264—45.4 **16 Claims**



1. The method of forming a smooth-sided foam plastic container from a expandable foam plastic cylinder comprising the steps of:

placing said expandable foam cylinder on a mandrel and heating said cylinder to a desired temperature over a desired interval to initially size the wall thickness thereof;

removing said cylinder from said mandrel and inserting same in the mold cavity of a steam heated expandable foam plastic bead container mold of a substantially conformal interior shape;

injecting expandable foam plastic beads into one end of said mold; and

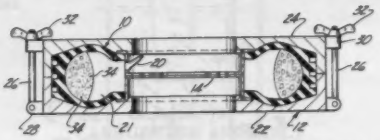
heating said mold to cause said beads to expand and mutually fuse with themselves and one edge of said cylinder to form a container bottom which is seamlessly integrated with said cylinder to provide a seamless foam container.

4,060,578

METHOD OF FOAM-FILLING A TIRE CARCASS

Frederick N. Kisbany, 464 Lexington Road, Grosse Point Farms, Mich. 48236

Filed Oct. 30, 1973, Ser. No. 411,106
Int. Cl.² B29D *27/00*; B60C *7/00*
U.S. Cl. 264—46.6 **3 Claims**



1. The method of making a foam-filled tire comprising the steps of:

1. mounting a tire carcass on the rim of a wheel,
2. introducing sufficient foam-forming elastomer into the tire carcass as would be capable of forming a foam only partially filling the carcass interior;
3. pressuring the tire carcass interior to a relatively high superatmospheric pressure appreciably above the pressure to be employed within the tire at the time it is placed in service on the road,
4. reacting the foam-forming ingredients while the carcass interior is at the afore-mentioned relatively high superatmospheric pressure to produce a cured foam that only partially fills the carcass interior; and
5. later reducing the pressure within the tire interior space unoccupied by the foam to permit further expansion and to produce a final tire pressure that approximates expected normal road service pressure.

4,060,579

METHOD FOR THE CONTINUOUS FORMING OF FOAM BLOCKS

Willi Schmitzer, Birlinghoven; Heinz Kisteneich, St. Augustin, and Ferdinand Proksa, Bergisch-Neukirchen, all of Germany, assignors to Maschinenfabrik Hennecke GmbH, Leverkusen, Germany

Continuation of Ser. No. 371,812, June 20, 1973, abandoned. This application Feb. 11, 1975, Ser. No. 548,934
Claims priority, application Germany, June 24, 1972, 2231084
Int. Cl.² B29D *27/04*
U.S. Cl. 264—51 **8 Claims**

1. A method of continuously producing foam blocks comprising:

a. providing an elongated conveying surface divided into a first zone and a second zone

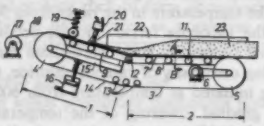
i. said first zone being inclined at a downward angle to the horizontal in the direction of the work,

ii. said second zone being substantially horizontal and forming a less than 180° angle with said first zone as measured between the top surfaces, and

iii. at least said second zone comprises an endless drivable conveyor belt,

b. positively feeding a continuous cover sheet to the surface of said first zone,

c. continuously depositing a foamable reaction mixture on top of said cover sheet in said first zone,



d. maintaining freshly deposited mixture in said first zone for a short enough time that it does not begin to foam substantially, and

e. allowing the mixture to foam in said second zone.

4,060,580

PROCESS FOR THE PRODUCTION OF SHAPED COMPONENTS OF WOOD MATERIAL, ESPECIALLY BOARDS, BOUND WITH A HYDRAULIC BINDER, PREFERABLY CEMENT

Helmut Pampel, Volksen, Germany, assignor to Bison-werke Bahre & Greten GmbH & Co. KG, Germany

Filed July 16, 1975, Ser. No. 596,523

Claims priority, application Germany, July 16, 1974, 2434212

Int. Cl.[2] B28B *23/00;* B29D *3/02;* B29J *5/00*

U.S. Cl. 264—109 8 Claims

1. In a process for making shaped articles of a wood material bonded with hydraulic cement wherein at least one mineralizing agent, water and a hydraulic cement are added to the cellulosic material comprised of wood particles, and the thus-prepared mixture is then shaped and pressed at a constant temperature above the freezing point, the improvement comprising: adding the amount of water, required for the hydraulic cement, to said cellulosic material and mixing said water therewith; thereafter adding said at least one mineralizing agent, reactive with a component of said cement, to said cellulosic material and then adding said hydraulic cement to the resulting wet cellulosic material.

4,060,581

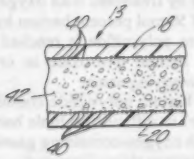
METHOD OF MAKING A COMPOSITE BURIAL VAULT

David L. Darby, 501 Brickyard Road, and James W. Darby, 2117 Smith, both of Danville, Ill. 61832

Filed Nov. 8, 1974, Ser. No. 522,133

Int. Cl.[2] B28B *11/06*

U.S. Cl. 264—131 5 Claims



1. The method of forming a composite burial vault comprising the steps of:

constructing a self supporting liner of thermosetting plastic resinous material,

while said liner is drying and before it has set, applying a granular material to at least one surface of said liner, said granular material being applied to substantially all of said surface, whereby when said liner has dried said granular material will be embedded in said surface;

after said liner has dried with said granular material embedded therein, pouring a flowable concrete material into contact with said surface and said granular material and permitting said concrete material to dry whereby said granular material will act as a mechanical bond between said liner and said hardened concrete.

4. The method of forming a composite burial vault comprising the steps:

constructing a self supporting liner of plastic resinous material,

after said liner has been formed, applying a solvent to at least one surface of said liner to thereby temporarily soften the surface,

while said liner is soft and before it has hardened again, applying a granular material to said softened surface of said liner, said granular material being applied to substantially all of said surface, whereby when said liner has dried said granular material will be embedded into said surface of said liner,

after said liner has dried with said granular material embedded therein, pouring a flowable concrete material into contact with said surface and said granular material and permitting said concrete material to dry whereby said granular material will act as a mechanical bond between said liner and said hardened concrete.

4,060,582

METHOD OF MANUFACTURING POLYOXYMETHYLENE FILAMENTS

Boris Afanasievich Egorov, ulitsa Pavla Tychiny, 12b, kv. 11; Alexandr Sergeevich Grzhimalovsky, ulitsa Karla Libknekhta, 11/1, kv. 15; Alexandr Vladimirovich Judin, Rusanovsky bulvar, 3, kv. 73; Konstantin Evgenievich Fishman, ulitsa Krasnotkatskaya, 17, kv. 47, and Ljudmila Dmitrievna Vernaya, ulitsa Yanvarskogo vosstaniya, 24, kv. 98, all of Kiev, U.S.S.R.

Filed Aug. 13, 1974, Ser. No. 497,060

Int. Cl.[2] D01D *5/12*

U.S. Cl. 264—210 F 3 Claims

1. A method of manufacturing a polyoxymethylene filament, comprising thermally treating polyoxymethylene having a molecular weight of from 30,000 to 100,000 and containing stabilizing additives including an antioxidant and an acceptor of formaldehyde in a quantity from 0.1 to 3.0% of the weight of said polyoxymethylene at a temperature of from 100° to 150° C and a residual pressure of from 1 to 100 mm. Hg to constant weight, melting said thermally treated polyoxymethylene at a temperature of from 170° to 230° C, forcing the melt through the orifices of an extrusion nozzle, cooling the jets of said melt leaving the orifices of the extrusion nozzle to a temperature of from 70° to 169° C in a cooling medium selected from the group consisting of air, an inert gas and steam, and drawing the moulded filament obtained after said cooling at a temperature of from 120° to 165° C to a length exceeding the initial length by about 7 to 14 times to obtain a polyoxymethylene filament having a tensile strength of from 70 to 100 grams per tex, an elongation at rupture of from 9% to 12%, and an initial modulus of from 1200 to 1800 kilograms per square millimeter.

4,060,583

ELECTRICALLY INSULATING COMPOSITION

James D. Groves, Hudson, Wis., and Stefano Loffredo, Naples, Italy, assignors to Minnesota Mining and Manufacturing Company, Saint Paul, Minn.

Continuation of Ser. No. 553,982, Feb. 28, 1975, abandoned.

This application Aug. 6, 1976, Ser. No. 712,399

Int. Cl.[2] H01B *3/30, 3/22, 3/20*

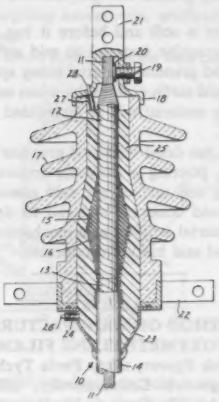
U.S. Cl. 264—272 24 Claims

10. A method for electrically insulating a section of power transmission line comprising

A. placing a housing capable of holding a liquid electrically insulating composition around a base conductor that is to be insulated; and

B. introducing into the housing a composition that comprises

(1) a dry water-immiscible nonvolatile free-flowing organic liquid that has a dielectric strength of at least 6 kilovolts per millimeter at a gap of 2.5 millimeters, a dielectric constant of no more than about 10, and a dissipation factor of no more than about 0.2, and that remains liquid at at least 0° C; and (2) at least two room-temperature-reactive ingredients that are uniformly and compatibly dispersed in said organic liquid and that chemically react with one another at room temperature to form a thermally stable high-viscosity thickening agent that is



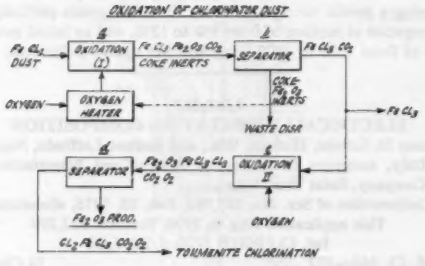
uniformly and compatibly dispersed in said organic liquid, the coreactive groups of said ingredients averaging between about 1.8 and 2.3 per molecule; said composition prior to reaction of said ingredients having a room-temperature viscosity of less than 5000 centipoises, and after reaction of said ingredients, (a) being flowable so as to assume the shape of its container, (b) having a room-temperature viscosity of at least 50,000 centipoises, and (c) having a variation in viscosity in the temperature interval 25° C to 100° C of at least 10,000 centipoises.

4,060,584

PROCESS FOR RECOVERY OF IRON OXIDE AND CHLORINE FROM DUST PRODUCED IN CHLORINATION OF TITANIFEROUS ORES

Achim Hartmann; Achim Kulling, and Hans Thumm, all of Leverkusen, Germany, assignors to Kronos Titan G.m.b.H., Leverkusen, Germany

Filed Feb. 14, 1977, Ser. No. 768,542
Claims priority, application Germany, Mar. 19, 1976, 2611667
Int. Cl.² C01G *49/06*; C01B *7/03*
U.S. Cl. 423—149 **7 Claims**



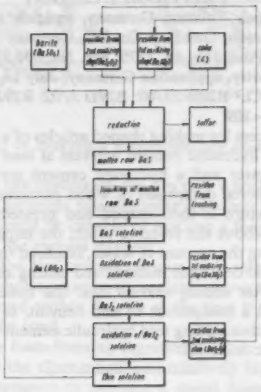
1. A multistage process for recovering gaseous chlorine and solid ferric oxide from chlorinator dust, said dust produced in the chlorination of titaniferous ores and comprising particulate ferrous chloride plus contaminates, said process comprising the steps of: (a) reacting said chlorinator dust at temperatures of from 500° to 800° C. with oxygen in an amount sufficient only to form solid materials consisting essentially of particulate ferric oxide and gases consisting essentially of varporous ferric chloride; (b) separating the solid materials including the particulate ferric oxide from the gases produced in step a while maintaining the temperature in the range from 500° to 800° C.; (c) reacting the vaporous ferric chloride produced in step a with additional oxygen to form particulate ferric oxide and gases consisting essentially of gaseous chloride, the reaction in stage c being initiated at temperature from 600 ° to 800° C. followed by gradual lowering of the temperature to below 600° C.; and then (d) separating the particulate ferric oxide from the gases produced in stage c.

4,060,585

PROCESS FOR PRODUCING BARIUM HYDROXIDE

Hans-Joachim Röhrborn, Moers, Germany, assignor to Metallgesellschaft Aktiengesellschaft, Frankfurt am Main, Germany

Filed Feb. 20, 1976, Ser. No. 659,875
Claims priority, application Germany, Mar. 24, 1975, 2512958
Int. Cl.² C01F *11/08*
U.S. Cl. 423—164 **4 Claims**



1. Process for continuously producing barium hydroxide from barite wherein sulfur is essentially the only bi-product, comprising the steps of:

a. reducing barite with carbon at temperatures of 800° to 1300° C and hot-leaching the reaction mixture of molten raw barium sulfide;

b. partially oxidizing the leaching product from the raw barium sulfide by treatment with oxygen-containing gases until a ratio of 50 mol percent barium hydroxide to 50 mol percent barium polysulfide is reached and precipitating the resulting barium hydroxide in crystalline form by cooling and removing same;

c. oxidizing the barium polysulfide contained in the mother liquor from (b) to difficulty soluble barium thiosulfate by treatment with oxygen-containing gases and removing the precipitated barium thiosulfate; and

d. recycling the precipitated barium thiosulfate from (c) to reduction step (a).

4,060,586

RECOVERY OF FLUORIDES FROM GYPSUM

John B. Sardisco, Shreveport, La., and Erhart Karl Drechsel, Houston, Tex., assignors to Pennzoil Company, Shreveport, La.

Filed June 15, 1976, Ser. No. 696,289
Int. Cl.² C01F *1/00, 5/00, 11/00*; C22B *26/20*
U.S. Cl. 423—167 **8 Claims**

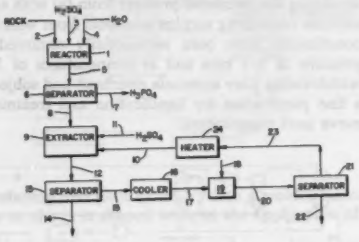
1. A method for conducting an acidulation reaction for the

production of phosphoric acid, gypsum and alkali metal silicofluoride which comprises reacting phosphate rock, sulfuric acid, and potassium ion provided by addition of a member selected from the group consisting of KH_2PO_4, $KHSO_4$, K_2SO_4, KOH and mixtures thereof, in sufficient amounts to acidulate the phosphate rock to form phosphoric acid and to cause precipitation of fluorides as potassium silicofluoride, containing the acidulation reaction to obtain reaction products comprising:

a. a phosphoric acid solution; and

b. a gypsum solids precipitate containing potassium silicofluoride;

separating the gypsum precipitate from the phosphoric acid



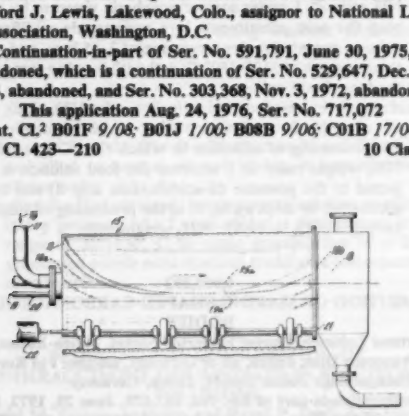
solution, removing the gypsum solids precipitate to an extractor maintained at a temperature of about 60°–100° C., contacting the gypsum in the extractor with an extractant solution selected from the group consisting of, (a) 5–30 weight percent phosphoric acid containing up to 0.3 parts of sulfuric acid per part of gypsum solids to be extracted, and (b) a fluorine-containing phosphoric acid containing up to 0.3 parts of sulfuric acid per part of gypsum being extracted, said extraction being carried out by contacting the gypsum mixture with a ratio of 3–10 parts of phosphoric acid solution per part of the gypsum mixture at a temperature of about 60°–100° C., separating and recovering the gypsum solids and a phosphoric acid extractant solution containing potassium silicofluoride.

4,060,587

GASEOUS AND LIQUID REACTANT TREATMENT

Clifford J. Lewis, Lakewood, Colo., assignor to National Lime Association, Washington, D.C.

Continuation-in-part of Ser. No. 591,791, June 30, 1975, abandoned, which is a continuation of Ser. No. 529,647, Dec. 16, 1974, abandoned, and Ser. No. 303,368, Nov. 3, 1972, abandoned.
This application Aug. 24, 1976, Ser. No. 717,072
Int. Cl.² B01F *9/08;* B01J *1/00;* B08B *9/06;* C01B *17/04*
U.S. Cl. 423—210 **10 Claims**



1. Method for carrying out a reaction between gaseous and liquid reactants which comprises conducting a gaseous reactant through a rotating substantially horizontally extending confined feedline containing a gaseous reactant flow path and having a center axis, maintaining liquid reactant in the feedline in the form of a pool within the lower horizontal portion below the center axis of the feedline in any position of rotation of such feedline, reacting such reactants in the presence of an assemblage of flexible linear means including a plurality of axially spaced apart successive sets of flexible linear means, each set extending substantially normal to the axis of the feedline and including a plurality of loosely disposed individual flexible linear means suspendedly attached at circumferentially spaced apart points in the vicinity of the respective ends of each such flexible linear means adjacent the peripheral interior portion of the feedline for rotation therewith and collectively forming a dynamic curtain of such flexible linear means operatively extending substantially normal to the axis of the feedline and into the path of the gaseous reactant above such pool for effecting the dynamic contacting and intermingling of the gaseous reactant with portions of the liquid reactant thereby taken up from the pool and wetting the surface of the flexible linear means thereat during rotation of the feedline, whereby to enhance the reaction between such reactants, and recovering from the pool portions of liquid reactant containing reaction product from the reaction between the gaseous and liquid reactants.

4,060,588

PROCESS FOR REMOVING SULFUR-CONTAINING GASES FROM WASTE GASES

Bernard G. Mandelik, Houston, Tex., assignor to Pullman Incorporated, Chicago, Ill.

Filed Dec. 22, 1975, Ser. No. 643,267
Int. Cl.² B01J *8/00;* C01B *17/00;* C01F *5/24;* C01B *17/02*
U.S. Cl. 423—242 **14 Claims**

1. In a process for reducing an alkaline earth metal sulfate/sulfite slurry to the corresponding sulfide by mixing the slurry with a carbonaceous reductant and heating the mixture to a temperature lower than the decomposition temperature of the alkaline earth metal sulfate/sulfite to cause the reduction reaction to occur, the improvement which comprises:

a. mixing sufficient reductant with the slurry, containing at least about 55% solids by weight, to provide a molecular excess of carbon of from about 15 to about 40% over that necessary to react with the alkaline earth metal sulfate/sulfite in the slurry to maintain a reducing atmosphere during the reducing step, wherein from from about 50 to about 63% of the reducing potential of the mixture is used in the reaction, and provide a combustible effluent gas from the reducing step having a heating value of at least about 80 BTU per standard cubic foot; and

b. burning the combustible effluent gas from the reducing step to dry the mixture at a temperature less than the gasification temperature of the reductant to remove substantially all the water in the mixture prior to the reducing step.

4,060,589

PROCESS FOR REDUCING NO_x AND/OR SO_x IN FEED GAS STREAMS

Robert H. Hass, Fullerton, and Michael H. Gibson, Santa Ana, both of Calif., assignors to Union Oil Company of California, Los Angeles, Calif.

Filed Jan. 26, 1976, Ser. No. 652,290
Int. Cl.² C01B *17/16*
U.S. Cl. 423—244 **9 Claims**

1. In a process for removing SO_x components from an industrial stack gas stream also comprising O_2 and water vapor, said water vapor being present in a concentration in excess of three times the molar percentage of SO_x components, wherein said SO_x components are converted to H_2S, which H_2S is subsequently removed, the improvement comprising:

1. contacting said stack gas stream with a solid carbonaceous material in a combustion zone maintained at a peak temperature between about 900° and 1600° F so as to (a) convert at least some of said SO_x components to H_2S and

COS, (b) consume essentially all of said O_2 in combustion of said carbonaceous material, and (c) consume a portion of said water vapor by reaction with said carbonaceous material to form CO and H_2, thereby producing a gaseous effluent of reduced SO_x content but containing water vapor, H_2S, COS, residual SO_x components, and at least sufficient H_2 and CO for the reduction of said residual SO_x components to H_2S in step (2) hereinafter;

2. contacting said gaseous effluent from step (1) with a solid catalyst comprising cobalt and molybdenum at a temperature between about 300° and 800° F so as to (a) reduce at least some of said residual SO_x components to H_2S and (b) convert essentially all of said COS and H_2S and essentially all of said CO to CO_2 and H_2 by reaction with water vapor;
3. withdrawing a purified gas stream containing H_2S as essentially the only gaseous sulfur component therein; and
4. removing said H_2S from said purified gas stream.

4,060,590

ZEOLITE NU-1

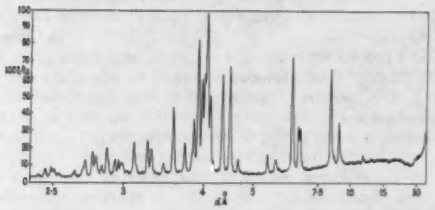
Thomas Vincent Whittam, Stockton-on-Tees, and Barry Youll, Middlesbrough, both of England, assignors to Imperial Chemical Industries Limited, London, England

Filed Sept. 29, 1976, Ser. No. 727,773

Claims priority, application United Kingdom, Oct. 3, 1975, 40631/75; Feb. 9, 1976, 4957/76; July 29, 1976, 31641/76

Int. Cl.² C01B *33/28*; B01J *29/28*

U.S. Cl. 423—328 **4 Claims**



1. Zeolite nu-1 having a composition expressed by the formula

$$0.9 \text{ to } 1.3\ R_2O\ .\ Al_2O_3\ .\ 20 \text{ to } 150\ SiO_2\ .\ 0 \text{ to } 40\ H_2O$$

where R is one or more of hydrogen, ammonium, phosphonium or $1/n$ of a cation having a valency n and having an X-ray diffraction pattern when R is H substantially as shown in Table 1.

4,060,591

CONTINUOUS PROCESS FOR RECOVERING PURE, CONCENTRATED AMMONIA

Alfred Garber, Linz, Austria; Hans-Martin Stöaner, Schwalbach, Germany; Paul Wiesner, Oberursel, Germany; Alan Sinclair, Frankfurt am Main, Germany, and Alfred Schmidt, Wien, Austria, assignors to Metallgesellschaft Aktiengesellschaft, Frankfurt am Main, Germany and Chemie Linz Aktiengesellschaft, Linz, Austria

Filed May 25, 1976, Ser. No. 690,203

Claims priority, application Germany, June 24, 1975, 2527985

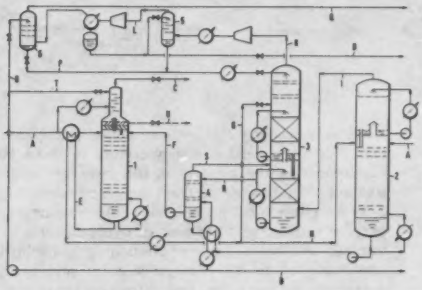
Int. Cl.² C01C *1/10, 1/12*; B01D *19/00*

U.S. Cl. 423—352 **17 Claims**

1. In a continuous process of recovering pure, concentrated ammonia, which contains not more than 0.2% H_2O, 0.1% CO_2, 10 ppm H_2S, and 10 ppm HCN, from aqueous liquors from which dust, tar, oil, and phenols have been removed, said aqueous liquors being condensates formed during the gasification or degasification of coal, or from aqueous liquors of similar compositions which contain free and/or combined ammonia in concentrations between 0.1 and 12 n carbon dioxide in concentrations between 0.1 and 12 n, hydrogen sulfide in concentrations between 0.003 and 3 n hydrocyanic acid in concentrations between 0.001 to 1 g/l, and residual organic substances introduced during a preceding dephenolation, which process includes the steps of stripping off gas water, de-acidification, scrubbing, and withdrawing ammonia from the top of a scrubbing column, the improvement which comprises the following steps:

a. stripping ammonia from the aqueous liquor in a stripping column having 15–80 actual plates or equivalent packing columns operated under a pressure of 1–2 bars with an inlet temperature of 30°–90° C, the ammonia and the acid constituents being jointly withdrawn overhead and waste water being withdrawn from the sump of the column,

b. scrubbing the overhead product from (a) with an aqueous solution containing surplus ammonia from which the acid constituents have been substantially removed under a pressure of 1–2 bars and at temperatures of 30°–70° C withdrawing pure ammonia overhead and subjecting it to a fine purification by liquification and treatment to remove inert constituents;



c. stripping most of the residual ammonia from the spent scrubbing liquor from (b) in a stripping column having 3–25 plates, or equivalent packing columns, operated under 1–2 bars, top temperatures of 50°–80° C, and sump temperatures of 60°–90° C, and withdrawing ammonia overhead and recycling it to (b); and

d. de-acidifying aqueous solutions having a $(CO_2 + H_2S)$; NH ratio $\geqq 1$ under superatmospheric pressure by stripping the acid constituents in a pressure de-acidification column operated under a pressure of 3–25 bars, and sump temperatures of 110°–180° C, and withdrawing same from the top of said column;

said steps being carried out in the sequence a), b), c), d), with the sump product of step c) being subjected to step d) in the processing of solutions in which the $(CO_2 + H_2S) : NH_3$ weight ratio $\leqq 1$ whereas the feed solution is subjected to the pressure de-acidification step d) and this is succeeded by steps a), b), c) in the processing of solutions having a $(CO_2 + H_2S) : NH_3$ weight ratio > 1.

4,060,592

METHOD OF MAKING SHAPED CARBONACEOUS BODIES

Hartmut Luhleich, Duren; Hubertus Nickel, Julich-Koslar, and Francesco Dias, Julich, all of Germany, assignors to Kernforschungsanlage Julich GmbH, Julich, Germany

Continuation-in-part of Ser. No. 267,479, June 29, 1972, Pat. No. 3,927,187. This application May 16, 1975, Ser. No. 578,192

Claims priority, application Germany, July 2, 1971, 2133044

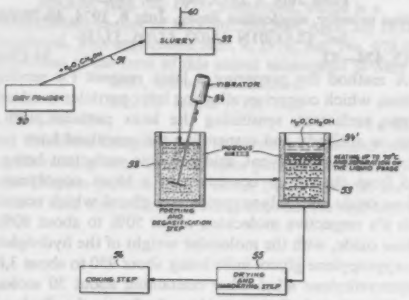
Int. Cl.² C01B *31/02, 31/04*

U.S. Cl. 423—448 **2 Claims**

1. A method of making a graphitic body from carbonaceous filler particles selected from the group which consists of petroleum coke, electrographite, natural graphite and carbon black, coated with a binder selected from the group which consists of

phenol-formaldehyde resin, pitch and tar, comprising the steps of:

a. forming a paste or slurry of the binder-coated filler particles in a carrier liquid containing 5% to 20% by volume of a solvent for said binder, said binder being at most slightly soluble in said liquid;



b. introducing said paste or slurry into a mold wherein said paste or slurry is shaped without the application of pressure;

c. drying the paste in said mold to form a shaped body therein; and

d. cokefying said body.

4,060,593

PREPARATION OF TITANIUM TRICHLORIDE

Yamaguchi Kazuo, Fujisawa; Kakogawa Genjiro; Hasuo Masayoshi, both of Yokohama; Nobuaki Goko, and Yasuo Maruyama, both of Kawasaki, all of Japan, assignors to Mitsubishi Chemical Industries, Tokyo, Japan

Continuation-in-part of Ser. No. 598,425, July 23, 1975, abandoned. This application July 31, 1975, Ser. No. 600,819

Claims priority, application Japan, July 31, 1974, 49-88476; July 31, 1974, 49-88477

Int. Cl.[2] C01G *23/02*

U.S. Cl. 423—492 **12 Claims**

1. A process for the production of solid purple titanium trichloride suitable as a catalyst for polymerization of an α-olefin, which comprises:

forming a homogeneous solution or mixture comprising titanium trichloride by treating titanium tetrachloride with an organoaluminum compound represented by the generic formula, $AlR^3_nX_{3-n}$, wherein R^3 denotes a hydrocarbon radical of 1 to 20 carbon atoms, n a number of the value of 1 to 3 and X a halogen atom, in the presence of an ether and hydrocarbon solvent, said ether having the generic formula, $R^1—O—R^2$ wherein R^1 and R^2 are normal alkyl or normal alkenyl having at least six carbon atoms; and

heating the thus obtained, homogeneous solution or mixture in the presence of a Lewis acid at a temperature in the range of 20°–150° C to cause precipitation of a finely granulated purple solid titanium trichloride and separating the precipitate.

4,060,594

REDUCING THE CONSUMPTION OF ANTHRAQUINONE DISULFONATE IN STRETFORD SOLUTIONS

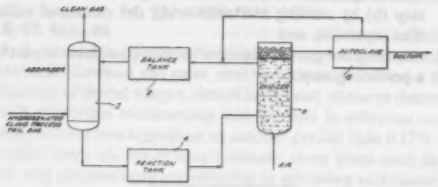
Donald M. Fenton, Anaheim, and Raoul P. Vaell, Los Angeles, both of Calif., assignors to Union Oil Company of California, Brea, Calif.

Filed May 21, 1975, Ser. No. 579,311

Int. Cl.[2] B01D *53/34*; C01B *17/04*

U.S. Cl. 423—573 R **4 Claims**

1. In the process for treating a hydrogen sulfide-containing hydrogenated Claus process tail gas to convert the hydrogen sulfide to elemental sulfur in which said gas is contacted with an aqueous alkaline washing solution containing a water-soluble metal vanadate and a water-soluble anthraquinone disulfonate to yield an effluent gas of reduced sulfur content, the solution is thereafter regenerated by contact with an oxygen-containing gas, elemental sulfur is recovered from said solution, and said regenerated solution is recycled to said gas-contacting step, and in which said anthraquinone disulfonate is being chemically consumed, the improvement which comprises employing as said washing solution an aqueous alkaline solution containing a water-soluble metal vanadate, a water-soluble anthraquinone disulfonate, and an effective amount of a complexing agent for ferrous ions comprised of a water-soluble, inorganic fluoride, whereby chemical consumption of said anthraquinone disulfonate is substantially reduced.



4,060,595

PROCESS FOR RECOVERING ELEMENTAL SULFUR FROM GASES HAVING A HIGH CARBON DIOXIDE CONTENT AND CONTAINING SULFUR COMPOUNDS

Karl-Heinz Eisenlohr, Buchschlag, and Karl Bratzler, Bad Homburg, both of Germany, assignors to Metallgesellschaft Aktiengesellschaft, Frankfurt am Main, Germany

Filed July 14, 1976, Ser. No. 705,115

Claims priority, application Germany, July 17, 1975, 2531930

Int. Cl.[2] C01B *17/04*

U.S. Cl. 423—574 R **6 Claims**

1. A process for recovering elemental sulfur from a gas continuous inorganic and/or organic sulfur compounds together with carbon dioxide and impurities which may include hydrogen cyanide and unsaturated hydrocarbon, said process comprising the steps of:

a. combining said gas with a combustion promoter and burning same with a slight excess to produce a combustion gas stream;

b. contacting said combustion gas stream with coke at a temperature of 300° to 450° C to remove residual oxygen, sulfur trioxide and nitrogen oxides from said combustion gas stream and forming a prepurified gas stream;

c. thereafter cooling said prepurified gas stream to a temperature of 20° to 80° C and scrubbing same with an aqueous solution of an absorbent selelected from the group which consists of alkali salts of weak inorganic acids and organic acids, and amines, thereby absorbing in said solution sulfur dioxide from the prepurified gas stream;

d. heating said absorbent and stripping sulfur dioxide from said absorbent and forming a hot SO_2-containing gas stream;

e. cooling the SO_2-containing gas stream and removing water by condensation therefrom;

f. adding hydrogen to said SO_2-containing gas stream and following step (e) and reacting the resulting mixture at a temperature of 200° to 450° C on a catalyst selected from the group which consists of oxides of cobalt, oxides of nickel, oxides of molybdenum and oxides of tungsten to reduce the SO_2 and form a sulfur and H_2S-containing gas stream;

g. separating from the sulfur and H_2S containing gas stream resulting in step (f) by cooling elemental sulfur and recovering same;

h. admixing with the hydrogen sulfide containing gas from which elemental sulfur has been removed in step (g) an amount of SO_2 stoichiomtrically sufficient to react with the H_2S thereof and passing the resulting mixture at a temperature of 200° to 300° C over an alumina or activated carbon catalyst to form the gas stream containing elemental sulfur;

i. separating elemental sulfur from the gas stream formed in step (h) by cooling and recovering the elemental sulfur thus separated; and

j. recycling the gas remaining after step (i) at least in part to a preceding step.

4,060,596

METHOD OF MAKING GOETHITE POWDER

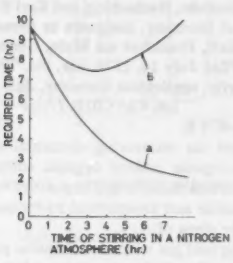
Tokio Nakamura, Yokohama, Japan, assignor to Sony Corporation, Tokyo, Japan

Continuation of Ser. No. 401,415, Sept. 27, 1973, abandoned. This application Oct. 31, 1975, Ser. No. 627,757

Claims priority, application Japan, Sept. 30, 1972, 47-98511

Int. Cl.² C01G *49/06*

U.S. Cl. 423—633 12 Claims



1. In the production of goethite, the improvement comprising a method of making acicular goethite powder comprising the steps of:

1. mixing in a relatively short time an aqueous solution of an alkali hydroxide selected from the group consisting of sodium hydroxide and potassium hydroxide with an aqueous solution of ferrous salt selected from the group consisting of ferrous chloride and ferrous sulfate under an inert atmosphere to form a suspension of ferrous hydroxide in a temperature range of 60° to 80° centrigrade,

2. continuously stirring said mixed ferrous hydroxide suspension for a period of 2 to 5 hours which time is substantially greater than said mixing time under an inert gaseous atmosphere until milk-white colored fine ferrous hydroxide suspension is formed, and during said period of stirring the temperature of the solution being in the temperature range of 60° to 80° centrigrade,

3. and then oxidizing said ferrous hydroxide suspension by an oxygen containing gas for a period of 4 to 6.5 hours until yellow colored goethite is formed, the temperature range being 50° to 80° centrigrade when the alkali hydroxide is potassium hydroxide and the ferrous salt is ferrous chloride and the temperature range being 40° to 60° centrigrade when sodium hydroxide is the alkali hydroxide and the ferrous salt is ferrous sulfate.

4,060,597

SEROLOGICAL REAGENT AND PREPARATION THEREOF

Yukio Sato; Seijun Wada, both of Osaka, and Shigetaka Matsuzawa, Tokyo, all of Japan, assignors to Takeda Chemical Industries, Ltd., Osaka, Japan

Filed July 7, 1975, Ser. No. 593,531

Claims priority, application Japan, July 8, 1974, 49-78604

Int. Cl.² G01N *31/00, 31/06, 33/16*

U.S. Cl. 424—12 14 Claims

1. A method for preparing a latex reagent for serologic reactions, which comprises allowing latex particles to adsorb a nonionic surfactant, sensitizing the latex particles with an antigen or antibody and suspending the sensitized latex particles in an aqueous solvent, said nonionic surfactant being selected from the group consisting of a block copolymer of ethylene oxide and polyoxypropylene glycol which contains, within it's respective molecules, about 50% to about 80% of ethylene oxide, with the molecular weight of the hydrophobic polyoxypropylene glycol units being about 950 to about 3,850; a polyoxyethylene alkyl ether containing about 30 moles to about 100 moles of ethylene oxide and wherein the alkyl group contains 12 to 18 carbon atoms; and a polyoxyethylene alkylaryl ether which contains about 30 moles to about 100 moles of ethylene oxide and wherein the alkylaryl is phenyl substituted with alkyl of 8 to 18 carbon atoms.

13. A latex reagent for serologic reactions, which is prepared by allowing latex particles to adsorb a nonionic surfactant, sensitizing the latex particles with an antigen or antibody and suspending the sensitized latex particles in an aqueous solvent, said nonionic surfactant being selected from the group consisting of a block copolymer of ethylene oxide and polyoxypropylene glycol which contains, within it's respective molecules, about 50% to about 80% of ethylene oxide, with the molecular weight of the hydrophobic polyoxypropylene glycol units being about 950 to about 3,850; a polyoxyethylene alkyl ether containing about 30 moles to about 100 moles of ethylene oxide and wherein the alkyl group contains 12 to 18 carbon atoms; and a polyoxyethylene alkylaryl ether which contains about 30 moles to about 100 moles of ethylene oxide and wherein the alkylaryl is phenyl substituted with alkyl of 8 to 18 carbon atoms.

4,060,598

TABLETS COATED WITH AQUEOUS RESIN DISPERSIONS

Gregor Groppenbächer, Mannheim-Feudenheim; Peter Rieckmann, Mannheim-Waldhof, and Werner Rothe, Hockenheim, all of Germany, assignors to Boehringer Mannheim G.m.b.H., Mannheim, Germany

Division of Ser. No. 463,216, April 22, 1974, Pat. No. 3,935,326, which is a continuation-in-part of Ser. No. 44,557, June 8, 1970, abandoned, which is a division of Ser. No. 740,058, June 26, 1968, abandoned. This application Oct. 28, 1975, Ser. No. 626,513

Claims priority, application Germany, June 28, 1967, 1617351

Int. Cl.² A61K *9/32*

U.S. Cl. 424—33 19 Claims

1. Coated tablet comprising a core of active material soluble in the gastrointestinal tract and a coating surrounding said core said coating comprising a continuous porous matrix of a synthetic resin insoluble in the gastrointestinal tract and a water or alkaline soluble material in the pores of said matrix, said coating being formed by applying to said core at least one layer of a coating composition of a film forming aqueous zynthetic resin dispersion with a resin content between 30 and 60% by weight and from 2 to 50% by weight of said water or alkaline soluble material and permitting said coating composition layer to dry, said coated tablet being initially air and moisture tight.

V964/5 N029 77 UMI

4,060,599

DENTIFRICES

Martin Cordon, Highland Park, N.J., assignor to Colgate-Palmolive Company, New York, N.Y.

Continuation-in-part of Ser. No. 561,842, March 25, 1975, Pat. No. 3,957,968, which is a continuation-in-part of Ser. No. 389,826, Aug. 20, 1973, abandoned, which is a continuation-in-part of Ser. No. 355,365, April 30, 1973, abandoned. This application Apr. 9, 1976, Ser. No. 675,098
The portion of the term of this patent subsequent to May 18, 1993, has been disclaimed.
Int. Cl.² A61K *7/16, 7/26*
U.S. Cl. 424—49 6 Claims

1. A dentifrice comprising, as an abrasive, ground crystals of alpha-alumina, ground to its ultimate particle form and having a mean ultimate particle size of about 1 to 2 microns, the proportion of said alpha-alumina being above 0.1% and less than 60%.

4,060,600

TREATING TEETH

Jaroslav Vit, Belle Mead, N.J., assignor to National Patent Development Corporation, New York, N.Y.

Filed Oct. 26, 1972, Ser. No. 301,073
Int. Cl.² A61H *9/00;* A61K *7/16*
U.S. Cl. 424—53 10 Claims

1. A method of treating teeth in dentistry, for the purpose of prevention of calculus, removal of caries or dissolving plaque which comprises bringing into contact with the teeth an amount of an aqueous solution effective for such purpose containing the reaction product resulting from mixing a solution of (1) a hypochlorite selected from the group consisting of the hypochlorites of Li, Na, K, Rb, Cs, Ca, Sr and Ba and a solution of (2) ethylene diamine tetra acetic acid.

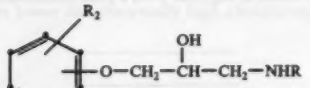
4,060,601

CERTAIN LOWER-ALKYL AMINO-2'-HYDROXY-PROPOXY PYRIDINES

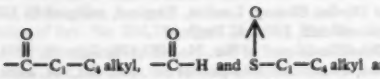
John J. Baldwin, Lansale, Pa., assignor to Merck & Co., Inc., Rahway, N.J.

Filed June 15, 1976, Ser. No. 696,237
Int. Cl.² C07D *213/50, 213/52;* A61K *31/395*
U.S. Cl. 424—263 26 Claims

1. Compound having the formula



wherein
R is C_3–C_4 branched alkyl and
R_2 is selected from trihalomethyl,



pharmaceutically acceptable salt thereof.

21. A method of treating hypertension in hypertensive humans which comprises oral, inhalation, suppository or parenteral administration of an effective amount of a compound of claim 1.

4,060,602

ORAL PREPARATIONS FOR PREVENTING DENTAL CARIES

Gerhard Julius Haas, Woodcliff Lake, N.J., and Edwin Bernard Herman, Yorktown Heights, N.Y., assignors to General Foods Corporation, White Plains, N.Y.

Continuation-in-part of Ser. No. 466,945, May 6, 1976, abandoned. This application Oct. 26, 1976, Ser. No. 735,723
Int. Cl.² A61K *7/26, 35/78*
U.S. Cl. 424—58 2 Claims

1. A method for inhibiting cariogenic streptococcus mutans, lactobacilli fermenti and casei, oral bacteria responsible for the formation of dental plaque, dental caries and mixtures thereof, which comprises reimmersing said bacteria in solutions containing as an active ingredient an amount greater than 0.17% of pimento berry oil, for at least 1 minute, three times each day, until said reimmersions are effective in inhibiting said bacteria responsible for the formation of dental plaque, dental caries and mixtures thereof.

4,060,603

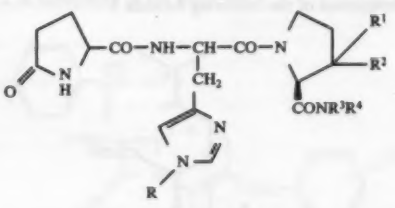
HISTIDINE DERIVATIVES

Barry A. Morgan, Hull, and Derek J. Schafer, Harpenden, both of England, assignors to Reckitt & Colman Products Limited, London, England

Filed Feb. 20, 1976, Ser. No. 659,913
Claims priority, application United Kingdom, Mar. 8, 1975, 10144/75
Int. Cl.² A61K *37/00;* C07C *103/52*
U.S. Cl. 424—177 14 Claims

1. Compounds of the formula:

I



wherein R is hydrogen or alkyl C_{1-3}; R^1 is alkyl or alkoxy C_{1-3}; R^2 is hydrogen, alkyl or alkoxy C_{1-3}; R^3 is hydrogen, alkyl C_{1-6} or cycloalkyl C_{3-6}; and R^4 is hydrogen or alkyl C_{1-6}.

4,060,604

ISOLATION OF UTERO-EVACUANT SUBSTANCES FROM PLANT EXTRACTS

Ramesh M. Kanojia, Somerville, N.J., assignor to Ortho Pharmaceutical Corporation, Raritan, N.J.

Filed Sept. 27, 1976, Ser. No. 726,860
Int. Cl.² A61K *35/78, 31/335*
U.S. Cl. 424—195 16 Claims

1. The method of purifying extracts containing utero-evacuant materials obtained from the zoapatle plant which comprises the steps of:

reacting the semi-purified utero-evacuant materials with a peracid to epoxidize the β,γ-unsaturated system, chromatographing the reaction mixture over an adsorbent material, eluting the adsorbent material with a mixture of polar and non-polar organic solvents and collecting the fractions containing the epoxidized and unreacted utero-evacuant materials.

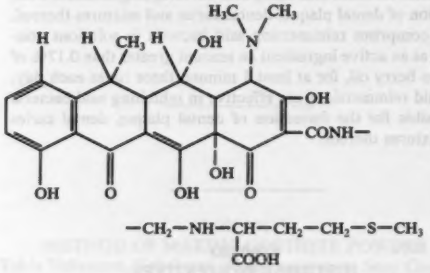
4,060,605

WATER-SOLUBLE DERIVATIVE OF 6-DEOXY-TETRACYCLINES

Gino Cotti, Monza (Milan), Italy, assignor to Ankerfarm, S.p.A., Milan, Italy

Continuation-in-part of Ser. No. 509,271, Sept. 25, 1974, abandoned. This application Sept. 25, 1975, Ser. No. 616,830
Claims priority, application Italy, Sept. 28, 1973, 29486/73
Int. Cl.[2] A61K *31/65*
U.S. Cl. 424—227 5 Claims

1. A compound with the formula:



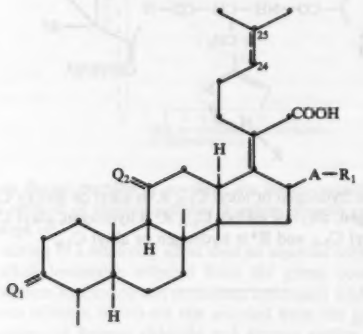
4,060,606

16-ETHERS OF FUSIDIC ACID DERIVATIVES

Welf von Daehne, Rungsted Kyst, and Poul Rodbroe Rasmussen, Frederikssund, both of Denmark, assignors to Leo Pharmaceutical Products Ltd. A/S, Ballerup, Denmark

Filed June 8, 1976, Ser. No. 693,976
Int. Cl.[2] A61K *31/56*; C07J *7/00*
U.S. Cl. 424—238 46 Claims

1. A compound of the following formula I:



in which the $C_{24\text{-}25}$ bond is a single or a double bond, and in which Q_1 and Q_2 stand for

or oxygen; A stands for oxygen, sulphur or a sulfinyl radical; R_1 stands for a straight or branched alkyl radical having from 1 to 8 carbon atoms, an alkenyl or alkynyl radical having from 2 to 6 carbon atoms, a cycloalkyl radical having from 3 to 7 carbon atoms in the alkyclic ring, an aryl, aralkyl or heterocyclylalkyl radical, or a heterocyclic radical having 5 or 6 ring atoms and containing oxygen, sulphur or nitrogen selected from the group consisting of 2- or 3-pyrrolyl, 2- or 3-furyl, 2- or 3-thienyl, 2-, 3- or 4-pyridyl, 2-, 4- or 5-pyrimidinyl, 2- or 3-pyrazolyl, imidazolyl, triazolyl, tetrazolyl, thiazolyl and thiadiazolyl, all R_1 radicals being optionally substituted; and non-toxic pharmaceutically acceptable salts and easily hydrolyzable esters thereof.

24. A pharmaceutical composition in dosage unit from for systemic treatment of bacterial infections in patients which comprises as a therapeutical ingredient at least one compound of claim 1, the therapeutically active compound being admixed with an atoxic, pharmaceutically acceptable carrier, and the dosage unit being between 100 to 1000 mg, preferably 100 to 500 mg, calculated as the free acid of the therapeutically active compound.

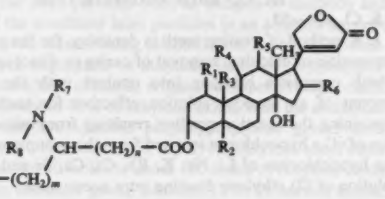
4,060,607

CARDENOLIDE DERIVATIVES

François-Xavier Jarreau, and Roger Gerard Sarfati, both of Paris, France, assignors to Etablissements Nativelle S.A., Paris, France

Filed May 10, 1976, Ser. No. 684,819
Claims priority, application France, May 16, 1975, 75.15462
Int. Cl.[2] C07J *19/00*
U.S. Cl. 424—241 9 Claims

1. Cardenolide derivatives having the general formula:



in which *n* and *m* are the same or different and can be equal to 0, 1, 2, 3 or 4; R_1, R_2, R_4, R_5, and R_6 are the same or different and denote a hydrogen atom or a hydroxy, alkoxy or acyloxy group; R_3 denotes a lower alkyl, aldehyde, halo-alkyl, hydroxyalkyl, acyloxyalkyl or ethylene dioxyalkyl group; R_7 denotes an hydrogen atom or an alkyl, alkyloxycarbonyl or aralkoxycarbonyl group; R_8 denotes a hydrogen atom or an alkyl group; R_9 denotes a hydroxy, alkoxy or aralkoxy group; and pharmaceutically acceptable mineral or organic salts of the aforementioned derivatives.

8. Method for treating cardiac insufficiency and rhythm irregularities comprising orally or parenterally administering a therapeutically effective amount of a cardenolide derivative as described in claim 1, together with a pharmaceutically acceptable carrier.

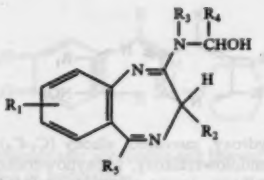
4,060,608

SUBSTITUTED HYDROXYMETHYL BENZODIAZEPINES

Umakant Devdas Shenoy, London, England, assignor to DDSA Pharmaceuticals, London, England

Continuation-in-part of Ser. No. 487,478, July 11, 1974, abandoned, Continuation-in-part of Ser. No. 481,944, June 21, 1974, abandoned. This application Oct. 14, 1975, Ser. No. 622,349
Int. Cl.[2] A61K *31/55*; C07D *405/06, 243/20*
U.S. Cl. 424—244 9 Claims

1. A benzodiazepine derivative of the formula I



I

in which R_1 represents a radical selected from the group consisting of hydrogen and halogen atoms and trifluoromethyl, cyano, nitro, lower alkyl, lower alkoxy and lower alkylthio:

R_2 represents a radical selected from the group consisting of hydrogen atoms and hydroxy, lower alkyl, lower alkoxy and lower alkanoyloxy:

R_3 represents a radical selected from the group consisting of lower alkyl, hydroxy (lower alkyl), lower alkenyl and benzyl;

R_4 represents a radical selected from the group consisting of lower alkyl and furyl; and

R_5 represents a radical selected from the group consisting of phenyl, (lower alkyl) phenyl, nitrophenyl, halophenyl, and pyridyl,

4-oxides of the said compounds and acid addition salts of the said compounds and of their 4-oxides with pharmaceutically acceptable acids.

9. A therapeutic composition comprising a tranquilizing, sedating or hypnosis-inducing amount of at least one compound according to claim 1 in admixture with a pharmacologically acceptable diluent.

4,060,609

BIPHENYLYL ETHERS AND METHOD OF USE

Erich Schacht; Werner Mehrhof; Rochus Jonas; Herbert Nowak, and Zdenek Simane, all of Darmstadt, Germany, assignors to Merch Patent Gesellschaft mit beschrankter Haftung, Darmstadt, Germany

Filed Oct. 29, 1974, Ser. No. 518,811

Claims priority, application Germany, Oct. 31, 1973, 2354444

Int. Cl.[2] C07D *295/08;* A61K *31/535*

U.S. Cl. 424—244 **21 Claims**

1. A biphenylyl ether of the formula R—O—CH_2—CH(OH)—CH_2Z wherein Z is piperidino and R is biphenyl-4 substituted in the 4'-position by F, Cl, Br, I, CF_3, NO_2 or piperidino; or a physiologically acceptable acid addition salt thereof.

21. A method of lowering abnormally high blood serum cholesterol levels which comprises administering systemically to the affected patient an amount of a compound of claim 1 effective to lower the abnormally high cholesterol level.

4,060,610

PHARMACEUTICAL COMPOSITIONS COMPRISING 7-ACYL-3-(SUBSTITUTED TRIAZOLYL THIOMETHYL)-CEPHALOSPORINS AND METHODS OF TREATING BACTERIAL INFECTIONS

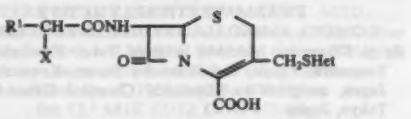
David A. Berges, Wayne, Pa., assignor to SmithKline Corporation, Phila., Pa.

Division of Ser. No. 536,759, Dec. 27, 1974, Pat. No. 3,989,694. This application Oct. 12, 1976, Ser. No. 731,401

Int. Cl.[2] A61K *31/545*

U.S. Cl. 424—246 **20 Claims**

11. A method of treating bacterial infections comprising administering internally either orally or by injection to an infected or susceptible warm-blooded animal an antibacterially effective but nontoxic dose of a compound of the formula:



in which:

R^1 is thienyl, phenyl or phenyl substituted with one or two groups selected from hydroxy, halo, nitro, hydroxymethyl, amino, lower alkylamino, di(lower)alkylamino, or carboxymethylamino, each alkyl having from one to four carbon atoms;

X is amino or hydroxy; and

Het is 1,2,4-triazolyl or 1,2,3-triazolyl each of which is substituted with $-(CHR^2)_nCOR^3$ where R^2 is hydrogen or lower alkyl or from one to four carbon atoms, *n* is zero to six and R^3 is hydroxy, lower alkoxy of from one to four carbon atoms, amino, lower alkylamino or di(lower) alkylamino, each alkyl having from one to four carbon atoms, or a non-toxic pharmaceutically acceptable salt thereof.

4,060,611

3-CARBAMYLBENZYL-7-(PHENYLGLYCYL)AMINO CEPHALOSPORIN DERIVATIVES

Brian George James, Cranleigh, England, assignor to Beecham Group Limited, Great Britain

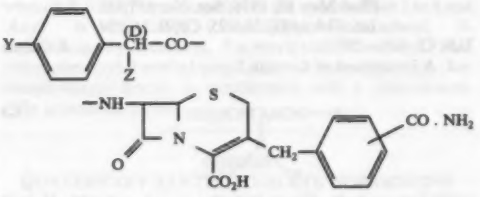
Filed July 26, 1976, Ser. No. 708,342

Claims priority, application United Kingdom, Aug. 15, 1975, 34008/75

Int. Cl.[2] A61K *31/545;* C07D *501/24*

U.S. Cl. 424—246 **15 Claims**

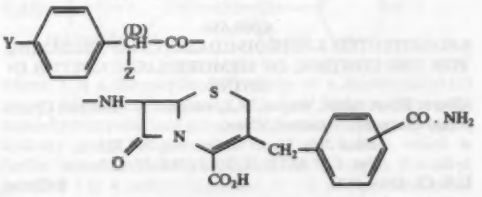
1. A compound of the formula:



pharmaceutically acceptable salt thereof wherein Y is H or OH and Z is NH_2 or OH.

6. An antibacterial pharmaceutical composition in a form for administration to humans comprising an antibacterially effective amount of a compound of claim 1 and a conventional physiologically acceptable carrier.

11. A method of treating bacterial infections in humans which comprises administering to a human in need thereof an antibacterially effective amount of a compound of the formula



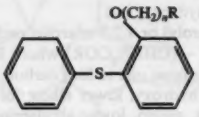
or a pharmaceutically acceptable salt thereof wherein Y is H or OH and Z is NH_2 or OH.

4,060,612
PHARMACEUTICALLY ACTIVE 2-OMEGA-AMINOALKOXYDIPHENYL SULFIDES

Ryoji Kikumoto, Machida; Akihiro Tobe, Kawasaki; Shinji Tonomura, Tokyo, and Hidenobu Ikoma, Kawasaki, all of Japan, assignors to Mitsubishi Chemical Industries Ltd., Tokyo, Japan

Continuation-in-part of Ser. No. 627,059, Oct. 30, 1975, abandoned. This application July 12, 1976, Ser. No. 704,493
Int. Cl.[2] A01N *9/22, 9/24;* C07C *93/06*
U.S. Cl. 424—248.52 12 Claims

1. A 2-omega-aminoalkoxydiphenyl sulfide compound having the formula:



wherein n 3–5 and when $n = 3$, R is C_1–C_3 alkylamino; when $n = 4$, R is amino, C_1–C_5 alkylamino, C_2–C_6 dialkylamino or morpholino; and when $n = 5$, R is C_2–C_6 dialkylamino or morpholino, and acid addition salts thereof.

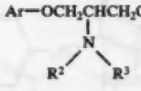
12. An antidepressant composition which comprises an antidepressant effective amount of a compound of claim 1 and a pharmaceutically acceptable adjuvant.

4,060,613
3-ARYLOXY-2(4-LOWERALKYL-1-PIPERAZINYL)-PROPANOLS, THEIR ALKYLETHERS, AND USE THEREOF

Jean-Marie Ferland, St. Laurent; Real Laliberte, Chomedey; Wilbur Lippmann, Montreal, and Thomas A. Pugsley, Kirkland, all of Canada, assignors to Ayerst McKenna and Harrison Ltd., Montreal, Canada

Filed May 19, 1976, Ser. No. 687,851
Int. Cl.[2] A61K *31/495;* C07D *241/04*
U.S. Cl. 424—250 5 Claims

1. A compound of formula 1



(1)

in which Ar is phenyl or 1-naphthyl; R^1 is hydrogen or lower alkyl having from one to six carbon atoms in a straight chain and three to four carbon atoms in a branched chain; and R^2 and R^3 together with the nitrogen atom to which they are joined form a heterocyclic amine radical consisting of 4-(lower alkyl)-1-piperazinyl; or a therapeutically acceptable acid addition salt thereof.

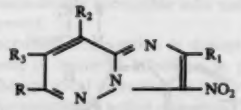
5. A method of alleviating symptoms of depression in a mammal comprising administering to said mammal an antidepressant effective amount of a compound of formula 1 of claim 1, or a therapeutically acceptable acid addition salt thereof.

4,060,614
6-SUBSTITUTED 3-NITROIMIDAZO[1,2-b]PYRIDAZINE FOR THE CONTROL OF HEMORRHAGIC COLITIS IN SWINE

Alberto Eilert Adam, Wayne, N.J., assignor to American Cyanamid Company, Stamford, Conn.

Filed July 22, 1976, Ser. No. 707,922
Int. Cl.[2] A61K *31/50, 31/54, 31/535*
U.S. Cl. 424—250 8 Claims

1. A method of treating hemorrhagic colitis in swine which comprises, administering to the animals a therapeutically effective amount of a compound having the formula:



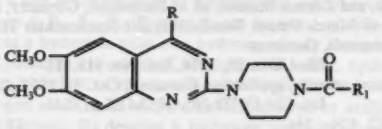
wherein R is hydroxy, mercapto, alkoxy (C_1-C_8), alkylthio (C_1-C_8), phthalimidoloweralkoxy, phenylloweralkoxy, lower alkylaminoloweralkoxy, lower alkoxyloweralkoxy, hydroxyloweralkoxy, lower alkenyloxy, halobenzoylloweralkoxy, amino, alkyl (C_1-C_8) amino, dialkyl (C_1-C_8) amino, di(hydroxyloweralkyl)amino, hydroxyloweralkylamino, lower alkoxyloweralkylamino, lower alkenylamino, phenylloweralkylamino, pyridylloweralkylamino, cycloalkyl (C_3-C_6) amino, diloweralkylaminoloweralkylamino, 1-piperidinyl, 1-pyrrolidinyl, 4-loweralkyl-1-piperazinyl, 4-lower alkoxyphenyl-1-piperazinyl, morpholino, imidazolyl, 4-carboloweralkoxy-1-piperazinyl or 4-diloweraminoloweralkyl-1-piperazinyl, sulfanilamido, alkyl (C_1-C_4)-sulfanilamido; thiomorpholino-S,S-dioxide; p-chlorobenzoyl hydrazido; p-chlorobenzylidene hydrazino; nicotinylidene hydrazino loweralkylthioloweralkoxy and loweralkylsulfonyloweralkoxy or —NR_4—CO—R_5 where R_4 is hydrogen or alkyl C_1-C_4 and R_5 is alkyl C_1-C_{11}, phenyl, 3,4-dichlorophenyl, 4-chloro-3-nitrophenyl, benzyl, mono and dihaloalkyl C_1-C_4 or 2-phenoxypropionamide; R_1 is hydrogen or alkyl C_1-C_4; R_2 and R_3 are hydrogen or methyl; and the pharmaceutically acceptable acid addition salts thereof.

4,060,615
2-PIPERAZINYL-6,7-DIMETHOXYQUINAZOLINES

William Lesley Matier, and John David Catt, both of Evansville, Ind., assignors to Mead Johnson & Company, Evansville, Ind.

Filed Feb. 18, 1976, Ser. No. 659,059
Int. Cl.[2] A61K *31/505;* C07D *403/04*
U.S. Cl. 424—251 19 Claims

1. A compound having the formula

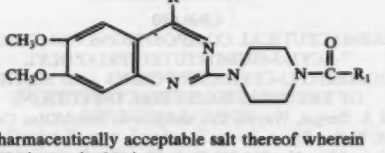


or a pharmaceutically acceptable salt thereof wherein

R is amino or hydrazino;

R_1 is cycloalkyl having 3 to 8 ring carbon atoms inclusive and cycloalkenyl having 4 to 8 ring carbon atoms inclusive.

13. A process for treating hypertension which comprises systemically administering to a mammal in need of said treatment an antihypertensive effective amount of a compound having the formula

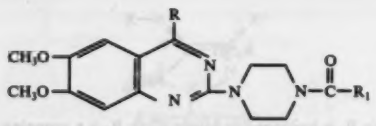


or a pharmaceutically acceptable salt thereof wherein

R is amino or hydrazino;

R_1 is cycloalkyl having 3 to 8 ring carbon atoms inclusive and cycloalkenyl having 4 to 8 ring carbon atoms inclusive.

16. A pharmaceutical composition in dosage unit form adapted for the systemic administration to a mammal comprising a dose of from 0.001 to 50 mg. per kilogram of body weight of said mammal of a compound having the formula



or a pharmaceutically acceptable salt thereof wherein

R is amino or hydrazino;

R_1 is cycloalkyl having 3 to 8 ring carbon atoms inclusive and cycloalkenyl having 4 to 8 ring carbon atoms inclusive.

4,060,616

PURINE DERIVATIVES WITH REPEATING UNIT

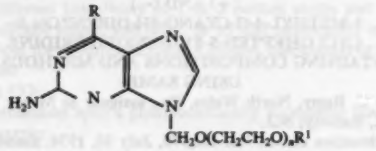
Howard John Schaeffer, Richmond, Va., assignor to Burroughs Wellcome Co., Research Triangle Park, N.C.

Filed Mar. 1, 1976, Ser. No. 662,899

Int. Cl.[2] A61K *31/52;* **C07D** *473/16, 473/18, 473/32*

U.S. Cl. 424—253 **87 Claims**

1. A compound of the formula I



(I)

where

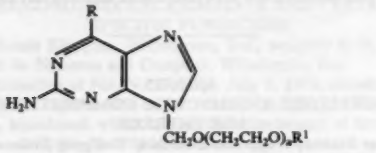
n is an integer of 2 to 10

R is halogen, hydroxy or amino

R^1 is hydrogen or

where R^2 is hydrogen, alkyl of 1 to 8 carbons, phenyl or naphthyl or a pharmaceutically acceptable salt thereof.

18. A pharmaceutical composition comprising an effective non-toxic antiviral amount of a compound of the formula I



(I)

where

n is an integer of 2 to 10

R is halogen, hydroxy or amino

R^1 is hydrogen or

where R^2 is hydrogen, alkyl of 1 to 8 carbons, phenyl or naphthyl or a pharmaceutically acceptable salt thereof in association with a pharmaceutically acceptable carrier therefore.

4,060,617

ESTERS OF THE OPHYLLINYLACETIC ACID

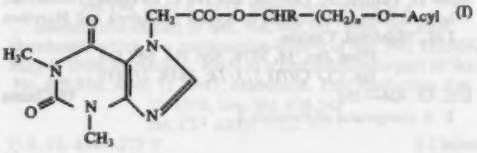
Karl Credner, Kaarst; Berthold Geisel, Gronau, Leine; Gunter Brenner, Grefrath, and Manfred Tauscher, Gronau, Leine, all of Germany, assignors to Johann A. Wulfing, Germany

Filed Apr. 1, 1976, Ser. No. 672,838

Int. Cl.[2] A61K *31/52;* **C07D** *473/08*

U.S. Cl. 424—253 **48 Claims**

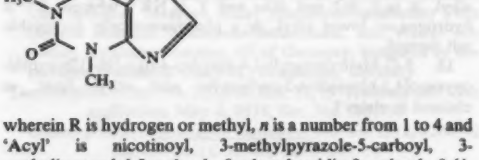
1. A compound of the formula (I):



(I)

wherein R is hydrogen or methyl; *n* is a number from 1 to 4 and 'Acyl' is nicotinoyl, 3-methylpyrazole-5-carboyl, 3-methylisoxazolyl-5-carboyl, 5-n-butylpyridin-2-carboyl, 2-(4-chlorophenoxy)-2-methyl-propionyl, 2-acetoxybenzoyl or theophyllinyl-7-acetyl.

15. A pharmaceutical composition in oral or parenteral administration form useful for treating adverse hyperlipidemic states in humans which comprises a therapeutically effective amount of a compound of the formula (I):



(I)

wherein R is hydrogen or methyl, *n* is a number from 1 to 4 and 'Acyl' is nicotinoyl, 3-methylpyrazole-5-carboyl, 3-methylisoxazolyl-5-carboyl, 5-n-butylpyridin-2-carboyl, 2-(4-chlorophenoxy)-2-methyl-propionyl, 2-acetoxybenzoyl or theophyllinyl-7-acetyl, in combination with a pharmaceutically acceptable carrier.

4,060,618

QUATERNARY XANTHINYLALKYL NORTROPINE

Karl H. Klingler, Langen; Rudolf Aurich, Karben, and Silke Habersang, Maintal, all of Germany, assignors to Deutsche Gold- und Silber-Scheideanstalt Vormals Roessler, Frankfurt, Germany

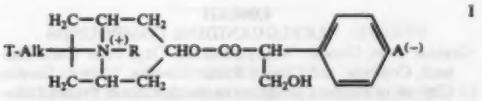
Filed Feb. 6, 1976, Ser. No. 656,085

Claims priority, application Austria, Feb. 21, 1975, 1355/75

Int. Cl.[2] A61K *31/52;* **C07D** *473/08*

U.S. Cl. 424—253 **12 Claims**

1. A quaternary xanthinylalkyl nortropine derivative of the formula



I

where T is a theophyllinyl-(7) group or a theobrominyl-(1) group, Alk is alkylene group with 2 to 10 carbon atoms or mono-hydroxy-alkylene group with 2 to 10 carbon atoms, the hydroxy group being attached to a carbon atom which is further bound exclusively to carbon and hydrogen, R is alkyl group of 1 to 4 carbon atoms and $A^{(-)}$ is an equivalent of an anion of a pharmaceutically acceptable acid.

11. A composition comprising the compound of claim 1 together with a pharmaceutically acceptable carrier, said com-

pound being present in an amount sufficient to provide a spasmolytic effect.

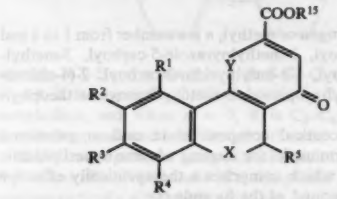
4,060,619

1,4-DIHYDRO-4-OXO-BENZOTHIOPYRANO (4,3-b)PYRIDINE-2-CARBOXYLATES AND DERIVATIVES

Adolf H. Philipp, St. Laurent, and Ivo L. Jirkovsky, Montreal, both of Canada, assignors to Ayerst McKenna and Harrison Ltd., Montreal, Canada

Filed Jan. 14, 1976, Ser. No. 649,113
Int. Cl.[2] C07D *513/14;* A61K *31/435*
U.S. Cl. 424—256 **15 Claims**

1. A compound of formula I



(I)

in which R^1,R^2,R^3 and R^4 are the same or different selected from the group consisting of hydrogen, halogen and lower alkyl; R^5 is hydrogen or lower alkyl; R^{15} is hydrogen or lower alkyl, X is S, SO and SO_2; and Y is NR^{16} wherein R^{16} is hydrogen or lower alkyl, or a pharmaceutically acceptable salt thereof.

13. 9-(1-Methylpropyl)-1,4-dihydro-4-oxo-5H-[1]benzothiopyrano[4,3-b]pyridine-2-carboxylic acid ethyl ester, as claimed in claim 1.

4,060,620

INDUCTION OF LACTATION IN NONPREGNANT DAIRY ANIMALS

Dale E. Bauman, St. Joseph, Ill.; Robert J. Collier, East Lansing, Mich., and Ray L. Hays, Champaign, Ill., assignors to University of Illinois Foundation, Urbana, Ill.

Filed May 17, 1976, Ser. No. 687,205
Int. Cl.[2] A61K *31/475*
U.S. Cl. 424—262 **12 Claims**

1. Method for inducing copious milk production in an initially nonpregnant, nonlactating dairy animal which has been hormonally induced into lactation which comprises parenterally administering to said animal after the start of the hormone treatment an effective lactation-increasing amount of reserpine or a pharmaceutically acceptable salt thereof.

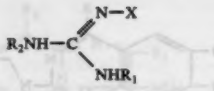
4,060,621

PYRIDYL ALKYLGUANIDINE COMPOUNDS

Graham John Durant, Welwyn Garden City; John Colin Emmett, Codicote, and Charon Robin Ganellin, Welwyn Garden City, all of England, assignors to Smith Kline & French Laboratories Limited, Welwyn Garden City, England

Division of Ser. No. 558,532, March 14, 1975, Pat. No. 3,971,786, which is a continuation-in-part of Ser. No. 384,992, Aug. 2, 1973, abandoned. This application Apr. 5, 1976, Ser. No. 673,516
Claims priority, application United Kingdom, Sept. 5, 1972, 41161/72
Int. Cl.[2] C07D *213/55;* A61K *31/34*
U.S. Cl. 424—263 **9 Claims**

1. A compound of the formula:



wherein R_1 is hydrogen or lower alkyl; R_2 is a grouping of the formula:

$$\text{Het} - (CH_2)_m Z (CH_2)_n -$$

wherein Het is a pyridyl ring which is optionally substituted by lower alkyl, trifluoromethyl, hydroxy, halogen or amino; Z is sulphur, oxygen, NH or a methylene group; *m* is 0, 1 or 2 and *n* is 2 or 3, the sum of *m* and *n* being from 2 to 4; X is COR_3, CSR_3, SO_2R_4 or nitro; R_3 is lower alkyl, lower alkoxy, or amino; and R_4 is lower alkyl, trifluoromethyl or amino or a pharmaceutically acceptable acid addition salt of said compound, provided that X is nitro only when Z is methylene and R_3 is amino only when Z is sulphur, oxygen or NH.

8. A method of inhibiting H-2 histamine receptors which comprises administering orally or parenterally to an animal in need thereof an effective amount to inhibit said receptors of a compound of claim 1.

4,060,622

(+) AND (−) 1-METHYL-4-(3-CYANO-5H-DIBENZO(a,d)-CYCLOHEPTEN-5-YLIDENE)PIPERIDINE CONTAINING COMPOSITIONS AND METHODS FOR USING SAME

David C. Remy, North Wales, Pa., assignor to Merck & Co., Inc., Rahway, N.J.

Continuation of Ser. No. 486,978, July 10, 1974, abandoned. This application Jan. 27, 1976, Ser. No. 652,674
Int. Cl.[2] A61K *31/445*
U.S. Cl. 424—267 **4 Claims**

1. A method of producing a tranquilizing effect comprising administering to a patient in need of such treatment a therapeutically effective amount of (−) 1-methyl-4-(3-cyano-5H-dibenzo[a,d]-cycloheptен-5-ylidene)-piperidine substantially free of the corresponding dextrorotary isomer or a nontoxic pharmaceutically acceptable acid addition salt thereof.

2. A method of producing an anticholinergic effect comprising administering to a patient in need of such treatment a therapeutically effective amount of (+) 1-methyl-4-(3-cyano-5H-dibenzo[a,d]-cycloheptен-5-ylidene)-piperidine substantially free of the corresponding levorotary isomer or a nontoxic pharmaceutically acceptable acid addition salt thereof.

4,060,623

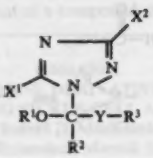
1,2,4-TRIAZOLE ANTIMYCOTIC COMPOSITIONS AND USE THEREOF

Werner Meiser, Wuppertal-Elberfeld; Wolfgang Kramer, Wuppertal-Barmen; Karl Heinz Buchel, and Manfred Plempel, both of Wuppertal-Elberfeld, all of Germany, assignors to Bayer Aktiengesellschaft, Germany

Division of Ser. No. 532,191, Dec. 12, 1974, Pat. No. 4,002,763, which is a division of Ser. No. 396,202, Sept. 11, 1973, Pat. No. 3,890,442. This application Jan. 2, 1976, Ser. No. 646,019
Claims priority, application Germany, Sept. 26, 1972, 2247186
Int. Cl.[2] A61K *31/41*
U.S. Cl. 424—269 **28 Claims**

14. A method for treating mycotic infections in humans and animals which comprises administering to a human or animal in need thereof an antimycotically effective amount of a 1,2,4-triazole of the formula:

V 9 6 4 / 5 N 0 2 9 7 7 UMI



wherein

X^1 is hydrogen or alkyl of 1 to 3 carbon atoms;

X^2 is hydrogen or alkyl of 1 to 3 carbon atoms;

R^1 is phenyl unsubstituted or substituted by one to five substituents selected from the group consisting of alkyl of 1 to 4 carbon atoms, the same or different halogen, the same or different haloalkyl of 1 to 2 carbon atoms and 2 to 5 halogen atoms, alkoxy of 1 or 2 carbon atoms, the same or different haloalkoxy of 1 or 2 atoms and 2 to 5 halogen atoms, and nitro, or by one substituent selected from the group consisting of phenyl, halophenyl or amino;

R^2 is hydrogen or alkyl of 1 to 6 carbon atoms;

R^3 is phenyl unsubstituted or substituted by one to five substituents selected from the group consisting of alkyl of 1 to 4 carbon atoms, the same or different halogen, the same or different haloalkyl of 1 or 2 carbon atoms and 2 to 5 halogen atoms, alkoxy of 1 or 2 carbon atoms, the same or different haloalkoxy of 1 or 2 carbon atoms and 2 to 5 halogen atoms, alkoxy of 1 or 2 carbon atoms, the same or different haloalkoxy of 1 or 2 carbon atoms and 2 to 5 halogen atoms, and nitro, or by one substitutent selected from the group consisting of phenyl, halophenyl or amino; and

Y is CO;

in combination with a pharmaceutically acceptable non-toxic, inert carrier.

4,060,624

CONTROLLING FUNGAL CROP DISEASES WITH MIXTURES OF METHYL 2-BENZIMIDAZOLECARBAMATE AND CERTAIN SPECIFIC FUNGICIDES

Hein Louis Klopping, Wilmington, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Continuation of Ser. No. 486,086, July 5, 1974, abandoned, which is a continuation-in-part of Ser. No. 434,556, Jan. 18, 1974, abandoned, which is a continuation-in-part of Ser. No. 260,196, June 6, 1972, abandoned, which is a continuation-in-part of Ser. No. 861,791, Sept. 29, 1969, abandoned, which is a continuation-in-part of Ser. No. 727,036, May 6, 1968, abandoned, which is a continuation-in-part of Ser. No. 629,914, April, 1967, abandoned. This application Apr. 12, 1976, Ser. No. 676,142

Int. Cl.[2] A01N *9/22, 9/12*

U.S. Cl. 424—273 R **5 Claims**

1. A fungicidal composition comprising a fungicidally effective amount of a mixture of methyl 2-benzimidazolecarbamate and an additive selected from the group consisting of tetramethylthiuramdisulfide, tetraethylthiuramdisulfide and zinc dimethyldithiocarbamate, the ratio of methyl 2-benzimidazolecarbamate to the additive being from 1:1 to 1:20.

4,060,625

MIXTURES OF METHYL 2-BENZIMIDAZOLECARBAMATE AND ETHYLENEBISDITHIO-CARBAMIC ACID SALTS AS FOLIAR FUNGICIDES

Hein Louis Klopping, Wilmington, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Continuation of Ser. No. 491,527, July 24, 1974, abandoned, which is a continuation-in-part of Ser. No. 324,826, Jan. 18, 1973, abandoned, which is a continuation-in-part of Ser. No. 260,196, June 6, 1972, abandoned, which is a continuation-in-part of Ser. No. 861,791, Sept. 29, 1969, abandoned, which is a continuation-in-part of Ser. No. 727,036, May 6, 1968, abandoned, which is a continuation-in-part of Ser. No. 629,914, April 11, 1967, abandoned. This application Apr. 12, 1976, Ser. No. 676,143

Int. Cl.[2] A01N *9/22, 9/12*

U.S. Cl. 424—273 R **6 Claims**

1. A fungicidal composition comprising a fungicidally effective amount of the mixture of methyl 2-benzimidazolecarbamate with the manganous or zinc salts of ethylenebisdithiocarbamic acid, the ratio of methyl 2-benzimidazolecarbamate to said manganous or zinc salts of ethylenebisdithiocarbamic acid being from 1:1 to 1:20.

4,060,626

INDOLE-CARBOXYLIC CARBON COMPOUNDS AND PHARMACEUTICAL COMPOSITIONS CONTAINING THEM

Vladimir Hrstka, Mannheim-Neuostheim; Manfred Hübner, Ludwigshafen; Manfred Kuhr, Mannheim-Sandhofen; Felix Helmut Schmidt, Mannheim-Seckenheim, and Walter Aumüller, Kelkheim-Munster, all of Germany, assignors to Boehringer Mannheim G.m.b.H., Mannheim, Germany

Continuation of Ser. No. 322,818, Jan. 11, 1973, abandoned. This application May 4, 1976, Ser. No. 683,110

Claims priority, application Germany, Jan. 26, 1972, 2203542

Int. Cl.[2] A61K *31/40;* C07D *209/18*

U.S. Cl. 424—274 **10 Claims**

1. A compound selected from

4-methoxy-5-methylindole-2-carboxylic acid,

5-methoxy-4-methylindole-2-carboxylic acid, and the pharmaceutically acceptable salts and lower alkyl esters thereof.

5. Method of depressing the blood sugar level in a subject which method comprises administrating to said subject an anti-diabetically effective amount of a compound selected from

4-methoxy-5-methylindole-2-carboxylic acid,

5-methoxy-4-methylindole-2-carboxylic acid, and the pharmaceutically acceptable salts and lower alkyl esters thereof.

9. Therapeutic composition having anti-diabetic properties comprising pharmaceutically acceptable carriers and, in anti-diabetically effective amount, a compound as claimed in claim 1.

4,060,627

SUBSTITUTED TETRAHYDROIMINOBENZO(b)THIEN-4-YLUREAS AS NOVEL GROWTH PROMOTING COMPOUNDS FOR ANIMALS

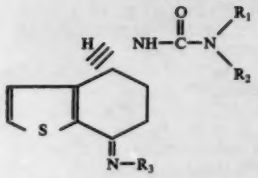
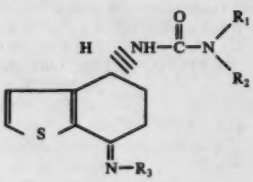
Goro Asato, Titusville, and Terence James Bentley, Cranbury, both of N.J., assignors to American Cyanamid Company, Stamford, Conn.

Filed Oct. 14, 1975, Ser. No. 622,298

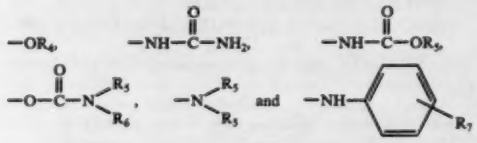
Int. Cl.[2] A61K *31/38;* C07D *333/16*

U.S. Cl. 424—275 **23 Claims**

1. A racemate consisting of enantiomeric 4,5,6,7-tetrahydro-7-(substituted)benzo[b]thien-4-ylureas of the formulae:

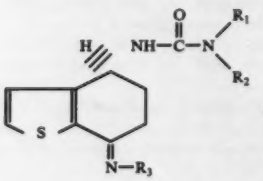
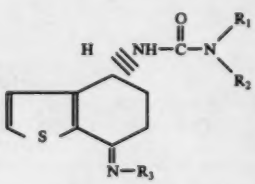

and


wherein R_1 is selected from the group consisting of hydrogen and alkyl C_1–C_4; R_2 is selected from the group consisting of hydrogen, hydroxy, alkyl C_1–C_4, allyl, 2-propynyl, alkoxy C_1–C_4 and benzyl; and R_3 is a moiety selected from the group consisting of those of the formulae:

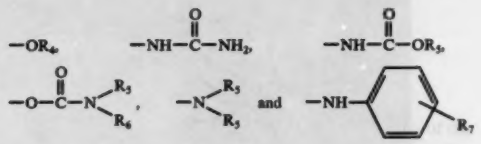


wherein R_4 is selected from the group consisting of hydrogen, alkyl C_1–C_4 and benzyl; R_5 is alkyl C_1–C_4; R_6 is selected from the group consisting of hydrogen and alkyl C_1–C_4; and R_7 is selected from the group consisting of hydrogen, chloro, methyl and methoxy.

22. An animal feed composition for improving feed efficiency and enhancing the growth rate of poultry, fur-bearing animals, and farm animals comprising a nutritionally balanced animal feed containing from 0.0001% to 0.08% by weight of a racemate consisting of enantiomers of the formulae:


and


wherein R_1 is selected from the group consisting of hydrogen and alkyl C_1–C_4; R_2 is selected from the group consisting of hydrogen, hydroxy, alkyl C_1–C_4, allyl, 2-propynyl, alkoxy C_1–C_4 and benzyl; and R_3 is a moiety selected from the group consisting of those of the formulae:



wherein R_4 is selected from the group consisting of hydrogen, alkyl C_1–C_4 and benzyl; R_5 is alkyl C_1–C_4; R_6 is selected from the group consisting of hydrogen and alkyl C_1–C_4; and R_7 is selected from the group consisting of hydrogen, chloro, methyl and methoxy.

4,060,628

2-(ALKYLHALOPHENYLIMINO)DITHIOLANES AND ECTOPARASITICIDAL COMPOSITION AND METHOD

Edgar Enders, Cologne, and Wilhelm Stendel, Wuppertal, both of Germany, assignors to Bayer Aktiengesellschaft, Germany

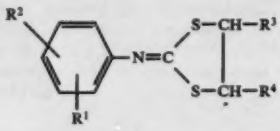
Filed Aug. 16, 1976, Ser. No. 714,401

Claims priority, application Germany, Aug. 22, 1975, 2537379

Int. Cl.[2] **A01N** *9/12;* **C07D** *339/06*

U.S. Cl. 424—277 **10 Claims**

1. A compound selected from the group consisting of a 2-phenylimino-1,3-dithiolane of the formula:



and the physiologically acceptable salts thereof wherein R^1 is alkyl of 1 to 6 carbon atoms;

R^2 is halo; and

each of R^3 and R^4 is hydrogen or alkyl of 1 to 6 carbon atoms.

10. A method of combatting ectoparasites on animals which comprises topically applying an effective amount of a compound according to claim **1**.

4,060,629

PHENOXY-PHENOXY-ALKYL-THIONOCARBAMATE COMPOUNDS

Friedrich Karrer, Zofingen, Switzerland, assignor to Ciba-Geigy Corporation, Ardsley, N.Y.

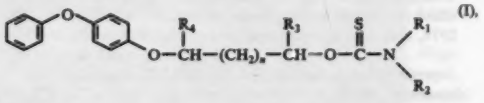
Filed Aug. 18, 1976, Ser. No. 715,592

Claims priority, application Switzerland, Aug. 22, 1975, 10901/75; July 15, 1976, 9085/76

Int. Cl.[2] **A01N** *9/12;* **C07C** *153/09, 153/11*

U.S. Cl. 424—300 **11 Claims**

1. A compound of the formula I


(I),

wherein

R_1 represents an alkyl group having 1 to 4 carbon atoms or an alkenyl group having 3 or 4 carbon atoms,

each of R_2 and R_3 represents a hydrogen atom or a methyl group,

R_4 represents a hydrogen atom or

R_3 and R_4, if n is 0, together with the carbon atoms to which they are attached form a cyclohexane ring, and

n is 0 or 1.

9. A method for combatting insects and acarids which com-

prises applying to the locus thereof an insecticidally and acaricidally effective amount of a compound according to claim 1.

4,060,630

ETHYLENEDIAMINE DERIVATIVES USEFUL IN TREATING SICKLE CELL ANEMIA

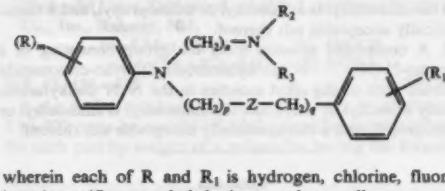
Joseph E. Dolfini, and Robert D. MacKenzie, both of Cincinnati, Ohio, assignors to Richardson-Merrell Inc., Wilton, Conn.

Filed Dec. 22, 1975, Ser. No. 642,782

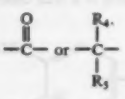
Int. Cl.[2] A61K *31/135, 31/535, 31/495, 31/445*

U.S. Cl. 424—300 17 Claims

1. A method of treating sickel cell anemia in a patient in need thereof which comprises administering to said patient in an amount effective to inhibit the sickling of red blood cells a compound of the formula



wherein each of R and R_1 is hydrogen, chlorine, fluorine, bromine, trifluoromethyl, hydroxy, a lower alkoxy group of from 1 to 4 carbon atoms or a straight or branched lower alkyl group of from 1 to 4 carbon atoms; R_2 is hydrogen or a straight or branched lower alkyl group of from 1 to 4 carbon atoms; R_3 is hydrogen or a straight or branched lower alkyl group of from 1 to 4 carbon atoms; Z is



wherein R_4 is hydrogen or lower alkyl of from 1 to 4 carbon atoms, and R_5 is hydroxy or alkylcarbonyloxy wherein the alkyl moiety has from 1 to 4 carbon atoms; each of *m* and *m'* is the integer 1 or 2; *n* is an integer of from 2 to 6; *p* is an integer of from 1 to 3; and *q* is an integer of from zero to 2; or pharmaceutically acceptable acid addition salts thereof.

4,060,631

AMINOETHYL OXIME ETHERS HAVING ANTI-DEPRESSIVE ACTIVITY

Hendricus Bernardus Antonius Welle, Utrecht, and Volkert Claassen, Weesp, both of Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

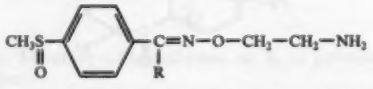
Filed Mar. 19, 1976, Ser. No. 668,491

Claims priority, application Netherlands, Mar. 20, 1975, 7503308

Int. Cl.[2] A61K *31/15, 31/275;* C07C *131/00*

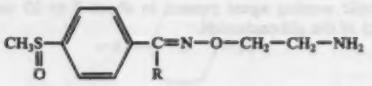
U.S. Cl. 424—304 12 Claims

1. An oxime ether compound of the formula



wherein R is a straight chain alkyl group having 4 to 6 C atoms, a benzyl group, a 4-ethoxybutyl group, a 5-methoxypentyl group, a 4-cyanobutyl group or a 5-cyano-pentyl group, and salts thereof with pharmaceutically acceptable acids.

12. Method of treating patients suffering from depression comprising administering to said patients an antidepressively effective quantity of a compound of the formula:



or a salt thereof with a pharmaceutically acceptable acid wherein R has the meaning as in claim 1.

4,060,632

METHOD FOR CONTROLLING ACARINA

Roger Williams Addor, Pennington, N.J., assignor to American Cyanamid Company, Stamford, Conn.

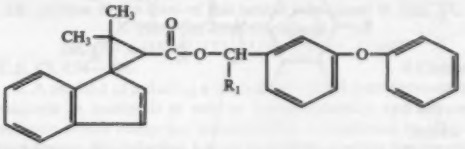
Continuation-in-part of Ser. No. 550,105, Feb. 13, 1975, Pat. No. 3,966,959. This application Jan. 28, 1976, Ser. No. 652,920

The portion of the term of this patent subsequent to June 29, 1993, has been disclaimed.

Int. Cl.[2] A01N *9/20, 9/24*

U.S. Cl. 424—304 7 Claims

1. A method for controlling ticks which comprises applying to adult ticks, a fecundity-suppressing amount of a spirocarboxylic acid compound having the formula



wherein R_1 is hydrogen, cyano or ethynyl, is a double or single bond and the steroisomers of the compounds.

4,060,633

PHENYLALKANOL NITRILES

Joachim Gante; Hans-Adolf Kurmeier; Dieter Orth; Erich Schacht, and Albrecht Wild, all of Darmstadt, Germany, assignors to Merck Patent Gesellschaft mit beschrankter Haftung, Darmstadt, Germany

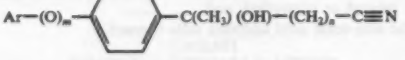
Filed Apr. 28, 1976, Ser. No. 681,175

Claims priority, application Germany, May 2, 1975, 2519719

Int. Cl.[2] A61K *31/275;* C07C *121/75*

U.S. Cl. 424—304 19 Claims

1. A phenylalkanol of the formula



wherein Ar is phenyl or phenyl monosubstituted or disubstituted by F, Cl, Br or CH_3, *m* is 0 or 1 and *n* is 2 or 3.

4,060,634

RAPIDLY RESORBABLE GLIBENCLAMIDE

Werner Rothe, Hockenheim; Helmut Heinemann, Heidelberg; Felix Helmut Schmidt, Mannheim-Seckenheim, and Günter Betzien, Mannheim, all of Germany, assignors to Boehringer Mannheim G.m.b.H., Mannheim, Germany

Continuation-in-part of Ser. No. 508,001, Sept. 20, 1974, Pat. No. 3,979,520. This application May 20, 1976, Ser. No. 688,435

Claims priority, application Germany, Sept. 26, 1973, 2348334

The portion of the term of this patent subsequent to Sept. 7, 1993, has been disclaimed.

Int. Cl.[2] A01N *9/16*

U.S. Cl. 424—321 5 Claims

1. A blood sugar lowering composition comprising microfine particulate glibenclamide having a surface area of about 3

to 10 m^2/g in admixture with a pharmacologically acceptable non-ionic wetting agent present in about 2 to 20 times the weight of the glibenclamide.

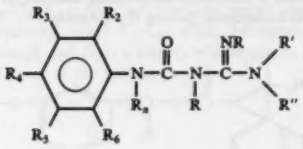
4,060,635

AMIDINOUREAS FOR TREATING DIARRHEA

Julius Diamond, Morris Plains, N.J., and George H. Douglas, Paoli, Pa., assignors to William H. Rorer, Inc., Fort Washington, Pa.

Filed Mar. 31, 1975, Ser. No. 558,187
Int. Cl.[2] A61K *31/17, 31/33, 31/40, 31/775*
U.S. Cl. 424—322 **22 Claims**

1. A method for the treatment of diarrhea in humans and mammals which comprises the administering thereto between 0.01 to 500 mg/kg per day of a compound of the formula:



where:

R_2, R_3, R_4, R_5 and R_6 may be the same or different and are:
hydrogen,
halo,
loweralkyl,
trifluoromethyl,
nitro,
methoxy, ethoxy
hydroxy,
benzyloxy
acetyloxy,
cyano,
trifluoromethoxy or
methylsulfonyl
R and R_a are hydrogen or
loweralkyl;
R′ and R″ are hydrogen,
alkyl,
cyclopropyl, cyclobutyl, cyclopentyl, cyclohexyl,
benzyl or phenethyl; and
the non-toxic acid addition salts thereof.

4,060,636

ACETYL- AND CARBALKOXYTHIOUREIDOBENZOPHENONES AS ANTHELMINTIC AGENTS

Edward E. Kilbourn, Chalfont, and W. David Weir, Levittown, both of Pa., assignors to Rohm and Haas Company, Philadelphia, Pa.

Filed June 10, 1976, Ser. No. 694,746
Int. Cl.[2] A01N *9/12, 9/20;* **A61K** *31/17, 31/27*
U.S. Cl. 424—322 **2 Claims**

2. A method for treating animals infested with helminths which comprises the administration to an animal in need of such treatment an anthelmintically effective amount of 3-(3-acetylthioureido)-4-aminobenzophenone.

4,060,637

MEDICAMENTS HAVING PSYCHOTROPIC PROPERTIES

M. Antoine Stenger; Henri Cousse, and M. Gilbert Mouzin, all of Castres, France, assignors to Pierre Fabre SA, Castres, France

Continuation of Ser. No. 264,501, June 20, 1972, abandoned.
This application Nov. 21, 1974, Ser. No. 525,950
Claims priority, application France, June 21, 1971, 71.22575
Int. Cl.[2] A61K *31/165*
U.S. Cl. 424—324 **8 Claims**

4. A method of reducing the occurrence of muscle spasms and for relaxing muscles in a host which comprises administering to the host an effective amount of a compound selected from the group consisting of a 5-bromo-N-(N′,N′-dialkylaminoalkyl)-ortho-cresotamide wherein each of the alkyl moieties in the N′,N′-dialkylamino moiety is methyl or ethyl, and the aminoalkyl is aminoethyl or aminopropyl, and a therapeutically acceptable salt thereof.

5. A compound selected from the group consisting of a 5-bromo-N-(N′, N′-dialkylaminoalkyl)-ortho-cresotamide wherein each of the alkyl moieties in the N′,N′-dialkylamino moiety is methyl or ethyl, and the aminoalkyl is aminoethyl or aminopropyl, and a therapeutically acceptable salt thereof.

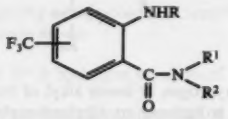
4,060,638

ANTHRANILIC ACID AMIDES

Paul L. Anderson, Dover, N.J., assignor to Sandoz, Inc., E. Hanover, N.J.

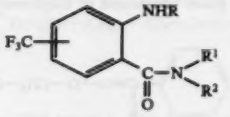
Filed May 27, 1975, Ser. No. 580,873
Int. Cl.[2] C07C *103/76;* **A61K** *31/165*
U.S. Cl. 424—324 **17 Claims**

1. A compound which is a free base of the formula



in which
R is a hydrogen atom, or alkanoyl having from 2 to 4 carbon atoms;
R^1 is a hydrogen atom or alkyl having from 1 to 6 carbon atoms; and
R^2 is alkyl having from 1 to 6 carbon atoms or hydroxy-alkyl having from 1 to 6 carbon atoms, the hydroxy function being located at a carbon atom other than the carbon atom adjacent to the nitrogen atom; provided that when R is alkanoyl then R^2 is alkyl;
or a non toxic pharmaceutically acceptable acid addition salt thereof when R is a hydrogen atom.

14. A method of treating anxiety in a mammal in need of such treatment which comprises internally administering an amount of a compound which is a free base of the formula



in which
R is a hydrogen atom, or alkanoyl having from 2 to 4 carbon atoms;
R^1 is a hydrogen atom or alkyl having from 1 to 6 carbon atoms; and
R^2 is alkyl having from 1 to 6 carbon atoms or hydroxy-alkyl having from 1 to 6 carbon atoms, the hydroxy function being located at a carbon atom other than the carbon atom

adjacent to the nitrogen atom; provided that when R is alkanoyl then R^2 is alkyl;

or a non-toxic pharmaceutically acceptable acid addition salt thereof when R is a hydrogen atom, effective in relieving anxiety in said mammal.

4,060,639

BROAD SPECTRUM ANTIBACTERIAL COMPOSITIONS CONTAINING TRIS-(HYDROXYMETHYL)-AMINOETHANE AND DICYCLOALIPHATIC-ALKYL POLYAMINES

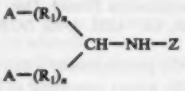
David P. Jacobus, Princeton; Eugene L. Dulaney, Summit, and Nathaniel Grier, Englewood, all of N.J., assignors to Merck & Co., Inc., Rahway, N.J.

Filed May 14, 1976, Ser. No. 686,428

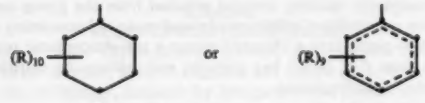
Int. Cl.² A01N *9/02, 9/20, 9/22*

U.S. Cl. 424—325 **24 Claims**

1. An antibacterial composition comprising an admixture of 1 to 500 parts by weight of tris(hydroxylamine)methylamine for each part by weight of a polyamine having the formula:



where A is alike or different cyclohexyl or cyclohexenyl of the formula:

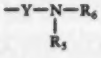


where

each R is either hydrogen or C_1 to C_6 alkyl, and the dished line indicates a single obefinic bond;

each *n* is alike or different and is the integer 0 or 1;

each R_1 is alike or different and is C_1 to C_4 alkylene; Z is

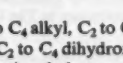


where

R_5 is hydrogen, aminoethyl, aminopropyl, C_1 to C_4 hydroxyalkyl, or C_2 to C_4 dihydroxyalkyl; and

R_6 is hydrogen, C_1 to C_4 hydroxyalkyl or C_2 to C_4 dihydroxyalkyl;

a. when Y is



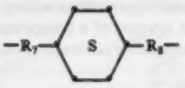
R_2 is 2-hydroxy-1,3-trimethylene, or R_1 as previously defined;

R_3 is hydrogen, C_1 to C_4 alkyl, C_2 to C_4 aminoalkyl, C_1 to C_4 hydroxyalkyl, or C_2 to C_4 dihydroxyalkyl;

R_4 is 2-hydroxy-1,3-trimethylene, or R_1 as previously defined;

or when R_3 and R_6 taken together are ethylene, R_4 is also ethylene, and R_5 is aminoethyl, aminopropyl, or aminohydroxypropyl; and

b. when Y is



R_7 is R_2, methylene, or a chemical bond between the cyclohexylene moiety and a first nitrogen; R_8 is R_4, methylene, or a chemical bond between the cyclohexylene moiety and a second nitrogen; and

c. when Y is $—R_2—$, then R_2, R_3 and R_6 are as previously defined, or acid addition salts thereof.

4,060,640

THERAPEUTIC AGENTS

Jiro K. Kodama, Herne Bay, England; George R. Haynes, and James R. Albert, both of Modesto, Calif., assignors to Shell Oil Company, Houston, Tex.

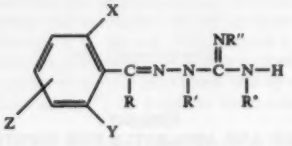
Continuation of Ser. No. 216,777, Jan. 10, 1972, abandoned, which is a division of Ser. No. 33,058, April 29, 1970, Pat. No. 3,658,993, which is a continuation-in-part of Ser. No. 674,753, Oct. 12, 1967, abandoned. This application June 8, 1976, Ser. No. 693,998

The portion of the term of this patent subsequent to Aug. 17, 1993, has been disclaimed.

Int. Cl.² A61K *31/155, 31/33, 31/505, 31/415*

U.S. Cl. 424—326 **4 Claims**

1. A method of inducing a central nervous system depressant response in mammals to reduce hyperexcitability and induce sedation which comprises administering to a mammal an effective dosage for inducing a central nervous system depressant response of a compound of the formula



wherein X is halogen or trifluoromethyl, Y and Z may be the same or different and each is hydrogen, halogen, trifluoromethyl or alkyl of 1 to 4 carbon atoms, R, R′, R″ and R* each is hydrogen, alkyl of 1 to 4 carbon atoms, alkenyl of 2 to 4 carbon atoms or alkynyl of 2 to 4 carbon atoms with the proviso that R″ and R* may together form an ethylene or vinylene bridge, with the further proviso that one of Y and R must be hydrogen, or a pharmaceutically acceptable salt thereof.

4,060,641

PHARMACEUTICALLY ACTIVE 2-(3-ALKYLAMINOPROPOXY)DIPHENYLMETHANES

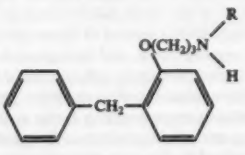
Ryoji Kikumoto, Machida; Akihiro Tobe, Kawasaki; Shinji Tonomura, Tokyo, and Hidenobu Ikoma, Kawasaki, all of Japan, assignors to Mitsubishi Chemical Industries Ltd., Tokyo, Japan

Division of Ser. No. 635,147, Nov. 25, 1975, Pat. No. 4,024,282. This application Oct. 21, 1976, Ser. No. 734,521

Int. Cl.² A01N *9/20, 9/24;* **C07C** *93/06*

U.S. Cl. 424—330 **4 Claims**

1. A compound having the formula (I):



(I)

wherein R is C_1–C_3 alkyl.

4. An antidepressant composition which comprises an antidepressant effective amount of a compound of claim 1 and a pharmaceutically acceptable carrier.

4,060,642

CONCENTRATED PROTEINACEOUS FOOD MATERIAL FROM MARINE ANIMAL MEAT

Taneko Suzuki, Tokyo, Japan, assignor to Tokai Regional Fisheries Research Laboratory, Tokyo, Japan

Filed Dec. 3, 1975, Ser. No. 637,310

Claims priority, application Japan, Dec. 16, 1974, 49-144219; June 18, 1975, 50-74729

Int. Cl.² A23J *3/00;* A23L *1/325*

U.S. Cl. 426—104 10 Claims

1. A method for the manufacture of a concentrated proteinaceous food material suitable for the production of processed foodstuffs which, when reconstituted with water, assumes a textural structure wherein an amorphous aggregate of meat protein is dotted with muscle fibers, resembling that of livestock meat, which method comprises mixing minced marine animal meat with an edible salt to adjust the pH of said meat to a value in the range of from 6.5 to 7.7, said edible salt being selected from the group consisting of common salt, monosodium glutamate, pyrophosphates and polyphosphates then kneading the mixture and contacting the resultant meat with a hydrophilic organic solvent precooled to 0° to 5° C and in an amount sufficient to extract fats and water, and drying the extracted meat thereby producing the proteinaceous food material.

4,060,643

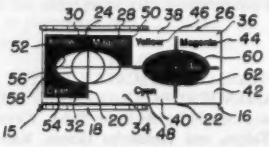
METHOD AND APPARATUS FOR IDENTIFYING COLOR SEPARATION FILM

William L. Blanks, 2343 N. Beckley Ave., Dallas, Tex. 75208

Division of Ser. No. 654,513, Feb. 2, 1976, Pat. No. 4,003,745. This application Aug. 13, 1976, Ser. No. 714,101

Int. Cl.² B32B *3/00*

U.S. Cl. 428—195 7 Claims



1. A color identifying tape for use in color separation photography comprising: a sheet of transparent material having first and second portions; an adhesive secured to one side of the transparent material; a black positive register mark on the first portion of the sheet; a negative register mark having a black outline in fixed spaced relation to the black positive register mark on the second portion of the sheet; colored backgrounds shaded in the three primary colors spaced in three quadrants about the black positive register mark, said backgrounds having negative indicia positioned therein to indicate the color of the background; and positive colored indicia shaded in primary colors and spaced in quadrants corresponding to the quadrants on the negative register mark corresponding to the quadrants on the colored backgrounds of the black positive register mark.

4,060,644

BLEACHING

John Edwin Braid, Warrington, England, assignor to Interox Chemicals Limited, London, England

Filed May 11, 1976, Ser. No. 685,188

Claims priority, application United Kingdom, Feb. 9, 1976, 5031/76

Int. Cl.² A23L *1/277, 1/325*

U.S. Cl. 426—261 9 Claims

1. A process for fish bleaching comprising the steps of contacting dark fish meat in the undissolved state with a dilute aqueous solution of hydrogen peroxide containing a polyphosphate at an initial pH of from 10.5 to 11 and at a temperature of from 10° to 30° C separating the fish from the solution when the fish meat has been bleached to a desired extent, removing any residual hydrogen peroxide from the fish, and adjusting the pH of the fish to below or approximately neutral.

4,060,645

DEHYDRATED FOOD PRODUCT

Pierre Risler, Montmorency; Jean Gireau, Montrouge; Pierre Rosé, Ennery, and Jean-Pierre Bisson, Boulogne-Billancourt, all of France, assignors to Societe d'Assistance Technique pour Produits Nestle S.A., Lausanne, Switzerland

Filed Nov. 24, 1975, Ser. No. 634,519

Claims priority, application France, Dec. 17, 1974, 74.41603

Int. Cl.² A23L *1/40, 1/226*

U.S. Cl. 426—302 12 Claims

1. A process for the production of a dehydrated food product selected from the group consisting of stocks, soups, consummes, soup bases, seasonings, condiments, sauces, extracts of meat, vegatable, fruit and spice supports based on dextrin which comprises extruding at a temperature in the range from 60° to 125° C. and under a pressure of from 1 to 15 bars a thermoplastic starting material selected from the group consisting essentially of edible powder and paste and containing up to 20% water into a chamber where a sub-atmospheric pressure from 0.01 to 0.3 bar prevails, and cutting the extruded product into fragments.

4,060,646

FOOD FAT

Naganathan Viswanath Bringi, Bombay, India, and Frederick Bolton Padley, Welwyn Garden City, England, assignors to Lever Brothers Company, New York, N.Y.

Filed Aug. 9, 1976, Ser. No. 712,669

Claims priority, application United Kingdom, Aug. 8, 1975, 33168/75

Int. Cl.² A23G *1/00;* A23D *5/00*

U.S. Cl. 426—607 11 Claims

1. A processed fat composition, containing; processed Mango kernel fat, wherein;

said processed Mango kernel fat,

a. is substantially free from glycerides containing at least two unsaturated fatty acid residues;

b. has an Iodine Value of less than 50; and

c. has melting characteristics suitable for confectionary purposes.

4,060,647

PULSED POWER APPLICATION SYSTEM

Peter N. Y. Pan, Country Club Hills, and Rafael J. Hernandez, Chicago, both of Ill., assignors to The Continental Group, Inc., New York, N.Y.

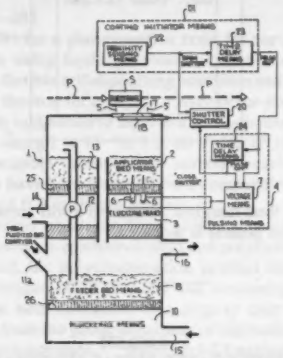
Division of Ser. No. 678,676, April 20, 1976, Pat. No. 4,027,607. This application Jan. 11, 1977, Ser. No. 758,444

Int. Cl.² B05D *1/06*

U.S. Cl. 427—21 15 Claims

1. A method of electrostatically powder-coating a substrate occupying a coating position adjacent thereto, comprising the steps of:

a. providing electrostatic powder particles in the vicinity of said coating position;
b. fluidizing said electrostatic powder to endow it with fluid-like characteristics;
c. pulsing said fluidized electrostatic powder by a high voltage pulse connected across a pair of electrodes disposed in the bed of the fluidized powder for a predetermined coating time so as to effect ionization of said electrostatic powder particles whereby to cause the establishment of an electric field attracting said electrostatic powder particles to said substrate; and



d. subsequently applying to said pair of electrodes a reverse electrical field attracting the excess of said ionized electrostatic powder particles away from said substrate.

4,060,648

SURFACE COATING PROCESS

Terence John Taylor-Brown, Ipswich; Paul Newton Calver, Great Bentley, both of England, and James Jack, deceased, late of Mistley, England (by Margaret Jack, administratrix), assignors to Union Carbide Corporation, New York, N.Y.

Filed Oct. 14, 1975, Ser. No. 622,368
Claims priority, application United Kingdom, Oct. 15, 1974, 44623/74
Int. Cl.² B05D *1/06, 7/04, 7/14*
U.S. Cl. 427—32 **23 Claims**

1. A process for coating a surface with electrically chargeable particles of material, which comprises passing the surface to be coated through or past an excited cloud of coating material having a surface resistivity of less than $10^{12}\Omega$ or a volume resistivity of less than $10^{11}\Omega$ cm., the excited cloud having been formed in an alternating electric field between two electrodes, one of which comprises a rotating drum which carries a metered supply of the particles of coating material.

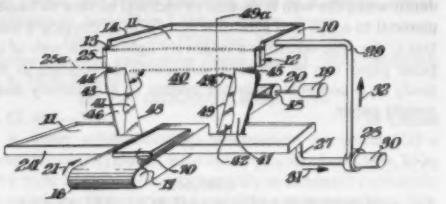
4,060,649

PAINT CURTAIN MACHINE AND METHOD OF PAINTING

James H. Coleman, Wichita Falls, Tex., assignor to Sprague Electric Company, North Adams, Mass.

Filed Dec. 6, 1976, Ser. No. 748,075
Int. Cl.² B05C *5/00;* **B05D** *1/30;* **H01G** *13/00*
U.S. Cl. 427—79 **15 Claims**

9. In a method for coating a substrate with a fluid paint including providing a falling paint curtain by discharging a fluid paint from a line of discharge at a paint reservoir and moving said substrate through said falling paint curtain, the improvement comprising (a) fixedly mounting two members, each having a planar surface, with said two planar surfaces extending from two spaced points, respectively, within said line of discharge, said points being each spaced from an extremity of said line of discharge, said planar surfaces facing each other and extending from said line downwardly and sloping toward each other for guiding therebetween the portion of said discharged paint intercepted at said points; and (b)



diverting at said points the excess paint falling from said line of discharge.

4,060,650

METHOD FOR PREVENTING OR ELIMINATING WATER-ABSORPTION WHITENING OF A MOLDED ARTICLE CONTAINING AN ACRYLONITRILE POLYMER OR COPOLYMER

Masaki Ohya, and Mitsuru Hoshino, both of Iwaki, Japan, assignors to Kureha Kagaku Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed June 24, 1976, Ser. No. 699,400
Claims priority, application Japan, June 24, 1975, 50-76528
Int. Cl.² B05B *5/00*
U.S. Cl. 427—161 **11 Claims**

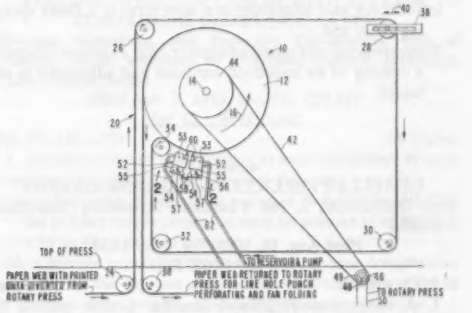
1. A method for preventing or eliminating the water-absorption whitening of a molded article containing an acrylonitrile polymer or copolymer which comprises immersing said molded article into an aqueous medium containing one or more salts selected from the group consisting of halides excluding iodide, a nitrate and an acetate of one or more element included in Groups I, II, III and VIII, Periods 1 to 4 of the Periodic Table, excluding zinc, and having a solubility in water at the temperature of use of at least about 10% by weight, in an amount of from about 5% by weight to the saturation amount of said salt.

4,060,651

METHOD FOR APPLYING STIFFENER TO COMPUTER PAPER

Frederick A. DuMert, 31 Muir Ave., Piedmont, Calif. 94610

Continuation of Ser. No. 484,538, July 1, 1974, abandoned. This application Feb. 23, 1976, Ser. No. 660,592
Int. Cl.² B05D *5/00, 1/28*
U.S. Cl. 427—285 **6 Claims**


TOP OF PRESS
TO RESERVOIR PUMP
PAPER WEB WITH PRINTED DATA DIVERTED FROM ROTARY PRESS
PAPER WEB RETURNED TO ROTARY PRESS FOR LINE HOLE PUNCH PERFORATING AND FAN FOLDING
TO ROTARY PRESS

1. A method of applying a band of flowable stiffening material to one face of a flexible web of computer paper and moving said web about a major portion of a cylindrical surface, said stiffening material being applied to said moving web at a location near the point at which the web commences to move

about said cylindrical surface with the stiffening material being capable of setting to a solidified condition, said materials being cured when the web is on said cylindrical surface to cause the material to set to said solidified condition to develop a built-in bias in the web whereby a relatively lightweight web of computer paper can be stiffened sufficiently to perform as effectively in a computer printout system as a relatively heavier weight paper.

4,060,652

NONDEPOLARIZING MUSCLE RELAXANT

Nikolai Vasilievich Khromov-Borisov, ulitsa Nalichnaya, 36, korpus 9, kv. 214; Samuil Fedorovich Torf, ulitsa Kurchatova, 4, kv. 86; Valentina Pavlovna Cherepanova, Vasilievsky Ostrov, 4 linia, 19, kv. 5; Anatoly Fedorovich Danilov, Vasilievsky Ostrov, 9 linia, 54, kv. 36, and Larisa Alexandrovna Starshinova, Annikov prospekt, 13, kv. 64, all of Leningrad, U.S.S.R.

Filed May 26, 1976, Ser. No. 689,978
Int. Cl.² A61K *31/14*
U.S. Cl. 424—329 **5 Claims**

1. A nondepolarizing muscle relaxant composition containing as the active ingredient an effective amount of p,p''-bis-triethylammonio-p-terphenyl dibenzenesulphonate in a pharamaceutical carrier.

4,060,653

COMPOSITE WIRE

William R. O'Day, Jr., Concord; Norman D. Bensky, Lexington, and James D. LeBlanc, Winthrop, all of Mass., assignors to Kennecott Copper Corporation, New York, N.Y.

Division of Ser. No. 444,702, Feb. 22, 1974, Pat. No. 3,932,344. This application Sept. 9, 1975, Ser. No. 611,787
Int. Cl.² B05D *1/08*
U.S. Cl. 427—423 **5 Claims**

1. In a method of coating surfaces by flame spraying a material selected from the group consisting essentially of a particulate material selected from the group consisting of molybdenum, boron tanalum, tungsten, tungsten carbide, alumina, zirconia, oxides of chrome, titania, alloys of nickel and chromium with iron and mixtures of these, said material having a particle size smaller than 80 - mesh in an admixture with a mixture of a thermoplastic resin and a phenolic resin in a cured state wherein said material comprises from about 75 percent to about 97½ percent by weight of total composite with the balance being said phenolic resin and thermoplastic resin in a ratio to each other of 4:1 to 1:9 comprising

introducing said admixture in a wire form in a flame spraying zone; and

flame spraying said cured admixture onto a surface, whereby a coating of an improved hardness and adherence is obtained.

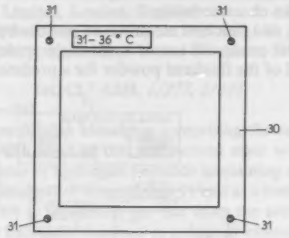
4,060,654

LAMELLAR PELLICLE FOR THERMOGRAPHY

Yves Quenneville, 2, rue d'Istanbul, Strasbourg (Bas-Rhin), France

Filed Aug. 16, 1976, Ser. No. 714,652
Int. Cl.² C09K *3/34*
U.S. Cl. 428—1 **7 Claims**

1. A temperature-responsive lamellar flexible pellicle for producing thermographic displays, comprising in combination a transparent inner sheet, a covering of liquid crystals which change color with temperature upon said inner sheet, an opaque inner backing sheet covering said crystals, an outer backing sheet covering said inner backing sheet, a transparent outer front sheet covering said transparent inner sheet, said outer backing sheet and said outer front sheet being of material having mechanical strength and being secured to each other by



adhesive at their marginal zones, and a stiff rectangular frame in which said pellicle is mounted.

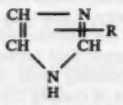
4,060,655

RESIN COATED METAL SUBSTRATES

Gerhard Johannes, Taunusstein; Erwin Gemmer, Falkenstein; Hans-Joachim Konig, Frankfurt am Main-Fechenheim, and Gunter Reinhard, Frankfurt am Main-Schwanheim, all of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt, Germany

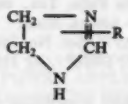
Continuation-in-part of Ser. No. 544,316, Jan. 27, 1975, abandoned. This application July 26, 1976, Ser. No. 708,729
Claims priority, application Germany, Feb. 2, 1974, 2405111
Int. Cl.² F16L *9/14;* B05D *1/04, 3/02;* B32B *15/08*
U.S. Cl. 428—35 **12 Claims**

1. An article comprising a metal substrate in the form of a pipe having at least 100 mm internal diameter or a container, said substrate being coated with a single at least 100 micron thick coating of a hardened epoxy resin composition formed from a homogenized solid mixture of (A) a solid epoxy resin based on epichlorohydrin and a component selected from the group consisting of (a) 4,4'-diphenylolpropane, b) 4,4'-diphenylolmethane and (c) a combination of (a) and (b), (B) from 1 to 12% by weight based on the epoxy resin of at least one hardener for said epoxy resin selected from the group consisting of (a) compounds of formula



(I)

wherein R is hydrogen or an alkyl group of 1 to 6 carbon atoms or an aromatic hydrocarbon residue with 6 to 10 carbon atoms, (b) compounds of formula



(II)

wherein R is hydrogen or an alkyl group having 1 to 6 carbon atoms or an aromatic hydrocarbon residue with 6 to 10 carbon atoms and (c) an adduct of any one of the hardener compounds (a) and (b) to an epoxy resin with an epoxy equivalent weight of from 50 to 2000, (C) a flow improving amount of a flow agent of 0.1 up to 5% by weight based on the epoxy resin and (D) a thixotropic agent in an amount of 1 to 5% by weight of the total composition.

4,060,656

SUPPORT FOR PHOTOSENSITIVE RESIN

Kiyomi Naka, Hino, and Teruo Takahashi, Kunitachi, both of Japan, assignors to Teijin Limited, Osaka, Japan

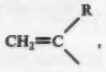
Continuation-in-part of Ser. No. 455,679, March 28, 1974, abandoned. This application July 15, 1975, Ser. No. 596,189
Claims priority, application Japan, Apr. 2, 1973, 48-37546
Int. Cl.[2] G03F *7/02*
U.S. Cl. 428—355 13 Claims

1. A support for a photosensitive resin for use in making a printing plate using liquid photosensitive resin, said support comprising a flexible self-supporting base plate and an adhesive layer formed thereon for applying a layer of the photosensitive resin, wherein said adhesive layer is a three-dimensional cured product containing 1×10^{-4} to 1×10^{-2} mol/gr. of effectively photopolymerizable unsaturated carbon-to-carbon double bonds, which have been formed from a composition consisting of (A), (B) and (C) as shown below:

A. a compound which is a linear polycondensation product formed between epichlorohydrin and polyhydric phenolic compound, the polycondensation product having a molecular weight of up to 4,000 and containing 1,2-epoxy groups at both terminals, or a diepoxy ester compound selected from the group consisting of diglycidyl-2,6-naphthalenedicarboxylate, diglycidyl-2,7-naphthalenedicarboxylate, diglycidyl o-phthalate, diglycidyl isophthalate, diglycidyl terephthalate, diglycidyl methylisophthalate, and diglycidyl methylterephthalate;

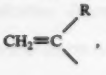
B. a compound selected from one of the group comprising

i. a compound containing an effectively photopolymerizable unsaturated carbon-to-carbon double bond moiety having the formula



wherein R is a hydrogen or an alkyl and a 1,2-epoxy group in the molecule and having a boiling point of at least 120° C., or

ii. a reaction product of the component (B) (i) with an amine curing agent selected from the group consisting of aliphatic amines, aromatic amines and amino-terminated polyamide resin obtained by the condensation of an aliphatic dicarboxylic acid with ethylene diamine and having a degree of polymerization of 5 to 20, the reaction product containing an effectively photopolymerizable unsaturated carbon-to-carbon double bond moiety having the formula



wherein R is hydrogen or an alkyl, and an amino group in the molecule and having a boiling point of at least 120° C.; and

C. an organic curing agent for epoxy resins containing at least two active hydrogen atoms but not containing an effectively photopolymerizable carbon-to-carbon double bond, or an organic compound convertible to said curing agent during the reaction, and selected from the group consisting of: aliphatic amines, aromatic amines, polycarboxylic acids, acid anhydrides, phenol resins, urea resins, polyester resins, polysulfide resins, melamine resins, and polyamide resins.

4,060,657

COATING COMPOSITIONS

Isamu Iwami, and Hideo Kinoshita, both of Kawasaki, Japan, assignors to Asahi-Dow Limited, Tokyo, Japan

Filed Mar. 30, 1976, Ser. No. 671,742
Claims priority, application Japan, Apr. 3, 1975, 50-39754; Feb. 4, 1976, 51-10276
Int. Cl.[2] D02G *3/36;* B32B *17/10*
U.S. Cl. 428—375 36 Claims

1. A water soluble coating composition comprising (a) a hydrophilic copolymer of 60 to 20% by mole of ethylene, 20 to 1% by mole of alpha,beta-ethylenically unsaturated carboxylic acid containing from three to nine carbon atoms and 20 to 79% by mole of polyvalent alcohol monoester of alpha,beta-ethylenically unsaturated carboxylic acid wherein the carboxylic acid moiety contains from three to nine carbon atoms, (b) a sufficient amount of a water-soluble base to at least partially neutralize said carboxylic acid, and (c) water.

32. A coating article obtained by coating a substrate with the coating composition as claimed in claim 1, and forming a water-insoluble film on the substrate.

4,060,658

GLASS FIBERS COATED WITH A POLYBUTADIENE HOMOPOLYMER LATEX-CONTAINING IMPREGNANT

Kingso C. Lin, and Donald J. Hammond, both of Newark, Ohio, assignors to Owens-Corning Fiberglas Corporation, Toledo, Ohio

Filed Sept. 19, 1975, Ser. No. 615,006
Int. Cl.[2] B32B *9/00;* D02G *3/00*
U.S. Cl. 428—378 8 Claims

1. Glass fibers in contact with the residue produced by removing water from a composition consisting essentially of a vinylpyridine-butadiene-styrene terpolymer, a polybutadiene homopolymer latex, a wax emulsion and a resorcinol-formaldehyde resin, with the polybutadiene homopolymer being present in an amount within the range from aboout 30 to about 80 weight percent.

4,060,659

ELECTRIC WIRES OR CABLES WITH STYRENE CONTAINING DIELECTRIC LAYER

Hironaga Matsubara, and Shousuke Yamanouchi, both of Osaka, Japan, assignors to Sumitomo Electric Industries, Ltd., Osaka, Japan

Filed Nov. 7, 1975, Ser. No. 629,827
Int. Cl.[2] B44D *1/42*
U.S. Cl. 428—379 16 Claims

1. Electric cables or wires having at least one dielectric layer consisting essentially of (1) of polyolefin and

2*a*. polystyrene, wherein for polymer composition (1)–(2a) the polystyrene is present in such an amount as to provide a 10 to 30% styrene content;

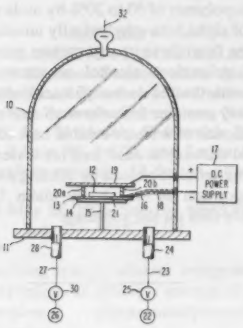
2*b*. a styrene copolymer, wherein for polymer composition (1)–(2*b*) the styrene copolymer is present in such an amount as to provide a 3 to 30% styrene content; or

2*c*. polystyrene and a styrene copolymer, wherein for polymer composition (1)–(2*c*) the polystyrene is present so as to provide a 10 to 30% styrene content and the styrene copolymer is present in such an amount so as to provide a 5 to 20% styrene content; all percentages being based on the entire polymer composition weight.

4,060,660
DEPOSITION OF TRANSPARENT AMORPHOUS CARBON FILMS

David Emil Carlson, Yardley, Pa., and Chester Edwin Tracy, Skillman, N.J., assignors to RCA Corporation, New York, N.Y.

Filed Jan. 15, 1976, Ser. No. 649,548
Int. Cl.[2] B05D *3/06*
U.S. Cl. 428—408 8 Claims



1. A method of depositing a transparent, resistive, amorphous carbon film on a glassy substrate which comprises:

a. heating said glassy substrate to a temperature in the range of from about 300° to 550° C. but below the softening temperature of the substrate in an evacuated chamber,

b. introducing a volatile hydrocarbon into said evacuated chamber,

c. applying a D.C. glow discharge between two electrodes situated in said chamber, the cathode of which is said glassy substrate, at a current density of from about 0.05 to about 1.0 mA/cm^2 for a period of about 15 seconds to about 3 minutes, so that said glassy substrate becomes coated with an amorphous carbon film.

7. A transparent amorphous carbon film having a room temperature surface resistance of from about 10^{12} ohm/sq. to about 10^7 ohm/sq.

4,060,661
VOLTAGE-DEPENDENT RESISTOR

Akihiro Takami, Katano; Takayuki Kuroda, Nishinomiya; Katsuo Nagano, Chitose, and Michio Matsuoka, Ibaraki, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

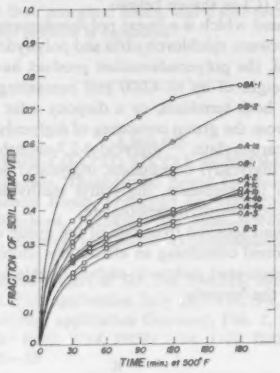
Filed Aug. 4, 1976, Ser. No. 711,639
Claims priority, application Japan, Aug. 22, 1975, 50-102442; Aug. 22, 1975, 50-102444; Aug. 22, 1975, 50-102445; Aug. 22, 1975, 50-102446; Aug. 22, 1975, 50-102447; Aug. 22, 1975, 50-102448
Int. Cl.[2] H01B *1/02, 1/08*
U.S. Cl. 428—432 16 Claims

1. A voltage-dependent resistor comprising a bulk consisting mainly of zinc oxide as a major part and, as additives, 0.01 to 10 mol % of Bi_2O_3, CoO, MnO, TiO and NiO, respectively and electrodes on said bulk, said electrodes having been formed by baking a silver paste comprising silver powder and a glass frit on said bulk, said glass frit containing as its principal contents 80 to 95% by weight of Bi_2O_3 and correspondingly 20 to 5% by weight of SiO_2 said glass frit also containing 1 to 5 parts by weight of B_2O_3 per 100 parts of said principal contents.

4,060,662
ARTICLE HAVING A SURFACE LAYER OF CATALYTIC ASH BY-PRODUCT OF COAL COMBUSTION

Clifton G. Bergeron, Urbana, and Lester W. Herron, St. Joseph, both of Ill., assignors to University of Illinois Foundation, Urbana, Ill.

Filed Aug. 25, 1975, Ser. No. 607,493
Int. Cl.[2] B32B *15/04, 15/18;* A21B *1/00*
U.S. Cl. 428—450 14 Claims



1. In an article of manufacture having a surface layer including means for catalytically enhancing the thermal oxidation of organic materials and a substrate for supporting the surface layer, the improvement wherein said surface layer comprises a finely divided ash by-product of the combustion of coal.

4. In an article of manufacture having a surface layer including means for catalytically enhancing the thermal oxidation of organic materials and a substrate for supporting the surface layer, wherein said surface layer comprises a composition consisting essentially of

	Wt. %
SiO_2	0 – 60
Al_2O_3	0 – 25
TiO_2	0.5 – 5
FeO	10 – 40
MgO	0.5 – 20
CaO	0 – 10
K_2O	0 – 10
MnO_2	0.1 – 5

9. In the process for thermal oxidation of organic materials wherein the materials are heated in the presence of a gaseous atmosphere including oxygen and contacted with a finely divided oxidation catalyst, the improvement wherein said oxidation catalyst is a finely divided ash product of the combustion of coal.

V 964/5 N029 77 UMI

4,060,663

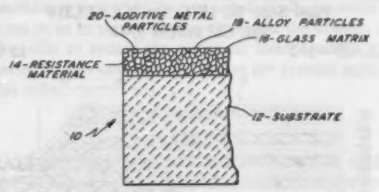
ELECTRICAL RESISTOR GLAZE COMPOSITION AND RESISTOR

Kenneth M. Merz, Gladwyne, and Howard E. Shapiro, Philadelphia, both of Pa., assignors to TRW Inc., Cleveland, Ohio

Continuation-in-part of Ser. No. 491,238, July 24, 1974, abandoned. This application Dec. 15, 1976, Ser. No. 750,661

Int. Cl.[2] B32B 5/16, 9/00; H01B 1/00

U.S. Cl. 428—428 12 Claims



7. An electrical resistor having a resistivity in the range of approximately 2 to 20 ohms per square, comprising a nonconductive ceramic body, a resistive film of glass on a surface of the body, and fine particles of an alloy containing approximately 75% to 80% by weight of nickel and approximately 20% by weight of chromium embedded within and dispersed throughout the glass film, the alloy being present in the resistive film in the amount of approximately 28% to 80% by weight.

4,060,664

BONDED COMPOSITE STRUCTURES

Thomas M. McGuire, Woodbury, and Kenneth Peacock, White Bear Lake, both of Minn., assignors to Minnesota Mining and Manufacturing Company, Saint Paul, Minn.

Filed Dec. 8, 1975, Ser. No. 638,451

Int. Cl.[2] B32B 27/04

U.S. Cl. 428—336 12 Claims

1. A bonded, composite structure comprising at least one polymeric substrate selected from the group consisting of polyester polymers and polyolefin polymers, said substrate having a solid material adhered thereto by an interposed bonding material which is a thin polymer zone having a thickness of up to about 500 Angstroms and consisting essentially of an organic polycarbodiimide polymer containing at least two carbodiimide groups, each linked directly to an aromatic nucleus through a carbodiimide nitrogen, said polycarbodiimide polymer containing about 1 to 35 weight percent carbodiimide groups.

4,060,665

ORNAMENTAL ASSEMBLY

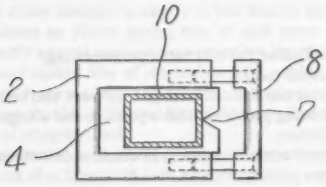
Chizuo Kato, No. 25-12, 2-chome,, Higashi-Ohi, Shinagawa, Tokyo, Japan

Filed Nov. 1, 1976, Ser. No. 737,568

Claims priority, application Japan, Aug. 16, 1976, 51-109535[U]

Int. Cl.[2] B32B 9/04

U.S. Cl. 428—542 2 Claims



1. An ornamental assembly comprising

a. a holder or holders each formed with an axial, insert-receiving groove which is opened at one side of said holder,

b. ornamental members formed integral with said holder or holders,

c. an insert having a cross-sectional configuration so that the insert may be snugly fitted into said groove of said holder and an opening having a cross-sectional configuration adapted to be snugly fitted over a member to be decorated,

a V-shaped groove being cut through one side of said insert along the axial center line thereof, and

d. a cover adapted to be releasably joined to said holder for covering the opened side thereof,

whereby the ornamental assembly may be securely attached to the member to be decorated by fitting said insert over the member to be decorated and then fitting said holder over said insert and thereafter joining said cover to said holder.

4,060,666

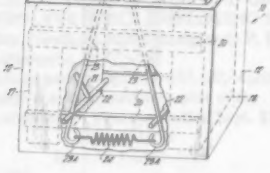
BATTERY CAPACITY INDICATOR FOR PRIMARY BATTERY

Lionel Anes, Califon, N.J., assignor to Compagnie Industrielle des Piles Electriques Cipel, Perret, France

Filed Feb. 23, 1976, Ser. No. 660,464

Int. Cl.[2] H01M 6/02

U.S. Cl. 429—91 5 Claims



1. A battery exhaustion indicator for use with a primary battery having at least one electrode which is depleted with use, comprising; a fluid tight case, a scale carried by the case, at least one sensing arm, resiliently urged against a major face of the battery electrode which is depleted with use; said sensing arm comprises a means for contacting a large average space on the said electrode; a rotatable shaft secured to the sensing arm, a resilient means coupled to the rotatable shaft for urging the sensing arm against the electrode major face and an elongated pointer coupled to said arm and having a free movable end adjacent to the scale for indicating the thickness of the depleted electrode.

4,060,667

HIGH TEMPERATURE SECONDARY BATTERIES

Barry Anthony Askew, Broadstone; Ronald Holland, Wareham; Douglas Inman, and Yusuf Mohamed Faruq Marikar, both of London, all of England, assignors to National Research Development Corporation, London, England

Continuation of Ser. No. 616,820, Sept. 25, 1975. This application Mar. 1, 1977, Ser. No. 773,162

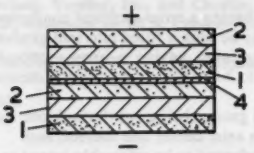
Claims priority, application United Kingdom, Aug. 22, 1975, 35044/75

Int. Cl.[2] H01M 4/36

U.S. Cl. 429—103 18 Claims

1. In a high temperature lithium-sulphur secondary battery comprising a stack of cells, each cell including a pellet of electrolyte suitable for said secondary battery and sandwiched between a negative electrode pellet composed at least partially of lithium and a positive electrode pellet, and an intercell metal sheet adapted to prevent direct chemical action between the electrode pellets of adjacent cells while maintaining electrical contact between them,

the improvement comprising using a positive electrode pellet composed substantially of titanium disulphide in



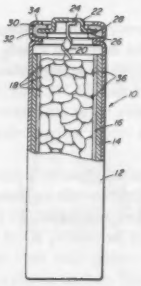
combination with the components of said lithium-sulphur secondary battery.

4,060,668

PRIMARY ELECTROCHEMICAL CELL

Franz Goebel, Ashland, Mass., assignor to GTE Laboratories Incorporated, Waltham, Mass.

Continuation-in-part of Ser. No. 539,749, Jan. 9, 1975, abandoned. This application Sept. 18, 1975, Ser. No. 614,467
The portion of the term of this patent subsequent to Apr. 25, 1994, has been disclaimed.
Int. Cl.² H01M 6/114
U.S. Cl. 429—122 **11 Claims**



1. A cathode material for placement in a primary electrochemical cell containing an electrolyte comprising: an aggregate of porous semi-rigid globules having a composition of from about 40 to 99 weight percent of carbon black and at least 1 weight percent of a mechanical binder which is inert in the primary electrochemical cell, the remainder being graphite, a plurality of fluid-conducting channels being defined between boundaries of adjacent globules to insure diffusion of the electrolyte throughout the cathode material during the life of the cell.

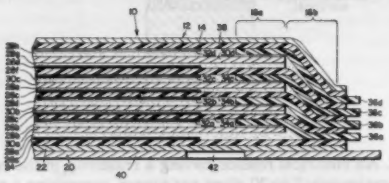
4. A primary electrochemical cell comprising:
an outer cell casing;
a first terminal on the exterior of the casing;
a primary electrochemical system including
an anode material connected to the first terminal,
a cathode material comprising an aggregate of semi-rigid globules for placement in the primary electrochemical cell and having a composition of from about 40 to 99 percent of carbon black and at least 1 weight percent of a mechanical binder which is inert in the primary electrochemical cell, the remainder being graphite, and
an electrolytic solution including a cathode depolarizer that can be electrochemically reduced on the surface of the carbon cathode,
a plurality of fluid conducting channels being defined between the boundaries of adjacent globules to enable diffusion of the electrolytic solution throughout the cathode material during the life of the cell;
a second terminal located on the exterior of the casing;
means for electrically insulating the second terminal from the first terminal; and
a cathode current collector connecting the cathode material to the second terminal.

4,060,669

FLAT BATTERY

Ralph D. Fanciullo, Waltham, Mass., assignor to Polaroid Corporation, Cambridge, Mass.

Filed Sept. 10, 1975, Ser. No. 612,210
Int. Cl.² H01M 6/46
U.S. Cl. 429—152 **13 Claims**



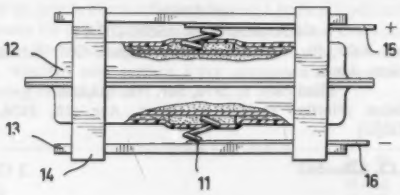
1. A planar battery comprising: at least two discrete, sheet-type electrically conductive electrode supports substantially permeable to volatile effluvia generated internally of said battery;
separator means, electrode active material and electrolyte configured and arranged between said electrode supports to define at least one cell within said battery;
means defining a seal about the peripheral portion of said cell, said seal being formed inwardly of peripheries of said electrode supports to expose a portion thereof to the external environment of said battery in which said means defining said seal includes an electrically insulative frame having an opening defined by an inner border, an outer periphery and surface sealing portions intermediate said inner border and outer periphery, and in which said electrically insulative frame outer periphery extends outwardly beyond the periphery of said electrode supports.

4,060,670

ALKALINE FLAT CELL BATTERY

Pentti Juuse Tamminen, Otsolahdentie 6, 02100 Tapiola, Finland

Filed Nov. 6, 1973, Ser. No. 413,288
Claims priority, application Finland, Nov. 10, 1972, 723151
Int. Cl.² H01M 2/30
U.S. Cl. 429—154 **17 Claims**



1. An alkaline flat cell battery comprising:
a. terminal means
b. at least one flat cell arranged between said terminal means and being provided with a positive and a negative current collector;
c. battery contact elements in connection with said terminal means
d. contact areas of insulating material on both sides of each cell and corresponding to each other and being arranged in contact with the current collectors;

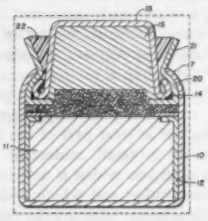
e. an envelope of plastics material, one for each of the cells, surrounding its respective cell to form a sealed unit; and

f. individual contact elements electrically interconnecting, on the one hand, adjacent cells and, on the other hand, the outermost cells and the battery contact elements, said individual contact elements being formed as metallic spring elements which are resiliently compressible in a direction substantially perpendicular to the contact area of the cell contacted thereby and have at least two point portions arranged to face in substantially opposite directions so as to pierce the envelope and the contact area of the cells to secure the electrical interconnecting of the battery when said terminal means are pressed against said flat cells.

4,060,671
BATTERY SEAL FOR ENCAPSULATABLE CELL

Richard J. VanderVelden, Wayzata, Minn., assignor to Medtronic, Inc., Minneapolis, Minn.

Filed Mar. 19, 1976, Ser. No. 668,595
Int. Cl.² H01M 2/08
U.S. Cl. 429—174 **7 Claims**



1. An encapsulatable electrochemical power cell comprising:

a. a first cup-shaped metallic member, said cup including therein a first electrochemical reactant which together with said first member defines a first polarity electrode;

b. a cover member for said first member of a second cup-shaped metal member formed of an elastically resilient material, said cup member having a base portion and side walls of a substantial height, said cover member containing a second electrochemical reactant which together with said cover member defines an electrode of opposite polarity to said first electrode; said cover member having the open end thereof of a size to be inserted partially within the open end of a said first member to define an overlap region therebetween and to leave a major portion of said side walls exposed above said overlap region;

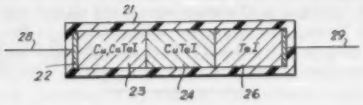
c. a grommet member of a substantially rigid material that is susceptible to cold flow positioned intermediate the first member and said cover member in the overlap region therebetween and constituting the sole material therebetween in said overlap region, said first member having the upper open end thereof formed inwardly to bear against said grommet member and thence to deform the open end of said cover member inwardly to less than its spring limit to produce an elastic spring bias of said cover member outwardly against said grommet member thereby providing a seal against loss of electrolyte from within said cell and which spring bias will follow the movement of said grommet should cold flow thereof occur to thereby maintain seal integrity; and,

d. a compressible and resilient layer of material having a thickness of at least 1/16 inch extending along and around the exposed sidewall of said cover member from said seal overlap region upwardly along the major portion of the sidewall of said cover member.

4,060,672
ELECTROCHEMICAL ENERGY CELL WITH SOLID ELECTROLYTE

Ulrich Von Alpen, Stuttgart; Jürgen Fenner, Ostfildern; Joachim Marcoll, Ludwigsburg, and Albrecht Rabenau, Stuttgart, all of Germany, assignors to Max-Planck-Gesellschaft zur Forderung der Wissenschaften e.V., Gottingen, Germany

Filed Apr. 29, 1976, Ser. No. 681,642
Claims priority, application Germany, Apr. 30, 1975, 2519351; Nov. 15, 1976, 2551346
Int. Cl.² H01M 6/18
U.S. Cl. 429—191 **5 Claims**



1. Electrochemical energy cell, comprising first and second electrodes and at least one ionically-conductive solid electrolyte between said electrodes, said electrolyte comprising a chalcogen halide of the formula $Cu_xCg_yX_z$ where X is selected from the group consisting of chlorine, bromine or iodine, x is 1, y is at least equal to 1, Cg is a member of the group consisting of Te and Se, and $z = 1$.

4,060,673
ION EXCHANGE MEMBRANES AND ORGANIC ELECTROLYTE CELLS EMPLOYING SAME

Arabinda N. Dey, Needham, Mass., assignor to P. R. Mallory & Co. Inc., Indianapolis, Ind.

Continuation-in-part of Ser. No. 817,150, April 7, 1969, abandoned, which is a continuation-in-part of Ser. No. 313,300, Dec. 8, 1972, abandoned. This application Sept. 13, 1973, Ser. No. 396,924
Int. Cl.² H01M 6/18
U.S. Cl. 429—192 **16 Claims**

1. In an organic electrolyte battery having a light metal anode, a cathode selected from the group consisting of metal halides and sulfur, and an organic electrolyte selected from the group consisting of gamma-butyrolactone, propylene carbonate, tetrahydrofuran, dimethylformamide, dimethylsulfoxide, dimethylcarbonate, acetonitrile, and the mixtures thereof, and containing an electrolyte salt dissolved therein, a microporous permselective barrier means therefor, separating said cathode and said electrolyte, and adapted to prevent diffusion of electrolytic anions, said barrier means comprising an ion-exchange membrane including a microporous substrate and a linear polyelectrolyte without cross-linking, said polyelectrolyte comprising a polymer insoluble in said organic solvent and having attached functional groups, said polyelectrolyte selected from the group consisting of Li, Na, and K polyacrylates.

4,060,674
ALKALI METAL ANODE-CONTAINING CELLS HAVING ELECTROLYTES OF ORGANOMETALLIC-ALKALI METAL SALTS AND ORGANIC SOLVENTS

Lawrence P. Klemann, Somerville, and Gerald H. Newman, Westfield, both of N.J., assignors to Exxon Research and Engineering Company, Linden, N.J.

Filed Dec. 14, 1976, Ser. No. 750,517
Int. Cl² H01M 6/14
U.S. Cl. 429—194 **15 Claims**

1. In an electrochemical cell which contains an alkali metal anode, a cathode and a non-aqueous electrolyte, the improvement comprising;

using as said electrolyte one which consists essentially of:

a. an organic solvent selected from the group consisting of inertly substituted and unsubstituted ethers, sulfones, or-

ganic sulfates, organic sulfites, organic nitrates and organic nitrites; and

b. electrolytically active alkali metal salts including an electrolytically active amount of an organometallic alkali metal salt having the formula:

$$ZMR_n$$

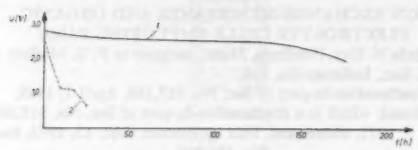
wherein Z is an alkali metal, wherein M is a metal selected from the group consisting of Zn, Cd, B, Al, Ga, Sn (stannous), In, Tl, P and As, wherein R represents *n* number of radicals which may be the same or different and are inertly substituted or unsubstituted organic radicals selected from the group consisting of alkyl radicals having 1 to 8 carbon atoms, aryl radicals having 6 to 18 carbon atoms, and alkaryl and aralkyl radicals having 7 to 50 carbon atoms, subject to the proviso that at least one R is an alkyl radical, and wherein *n* is a numerical value equal to one plus the valence of the Metal M.

4,060,675

GALVANIC ELEMENT WITH A NEGATIVE ELECTRODE OF LIGHT METAL, A NON-AQUEOUS ELECTROLYTE AND A POSITIVE ELECTRODE

Helmut Lauck, Glashutten, Germany, assignor to Varta Batterie Aktiengesellschaft, Hannover, Germany

Filed Mar. 8, 1976, Ser. No. 664,544
Claims priority, application Germany, Apr. 16, 1975, 2516702
Int. Cl.² H01M *6/14*
U.S. Cl. 429—194 9 Claims



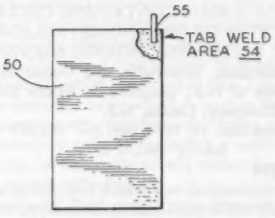
1. In a galvanic element with a negative electrode of a light metal, a non-aqueous electrolyte of a solution of a conducting salt in an organic solvent which does not set free H+-ions and a positive electrode containing a salt of a metal selected from the group consisting of silver, mercury, copper, lead and nickel, the improvement comprising said salt being an arsenite as the electrochemical reducible part of the positive electrode mass.

4,060,676

METAL PERIODATE ORGANIC ELECTROLYTE CELLS

Arabinda N. Dey, Needham, and Robert W. Holmes, Dedham, both of Mass., assignors to P. R. Mallory & Co. Inc., Indianapolis, Ind.

Division of Ser. No. 584,314, June 6, 1975, abandoned, which is a division of Ser. No. 245,510, April 19, 1972, Pat. No. 3,904,432. This application Aug. 27, 1976, Ser. No. 718,246
Int. Cl.² H01M *4/62*
U.S. Cl. 429—217 5 Claims



1. A solid cathodic electrode for a non-aqueous electrochemical cell wherein the cell comprises at least one positive electrode, at least one negative electrode, and an organic electrolyte with the electrodes disposed therein; the positive electrode, comprising the cathodic composition, including a periodate selected from the group consisting of silver, copper, iron, cobalt, nickel, mercury, thallium, lead, and bismuth and electrochemically inert conductive materials and binders wherein said periodate is substantially insoluble in said organic electrolyte.

4,060,677

PROCESS FOR MOLECULAR WEIGHT LOWERING OF VINYL HALIDE POLYMERS EMPLOYING SATURATED CARBON TO CARBON BONDED ALDEHYDES

Leigh E. Walker, Lewiston, N.Y., assignor to Hooker Chemicals & Plastics Corporation, Niagara Falls, N.Y.

Continuation-in-part of Ser. No. 552,826, Feb. 25, 1975, abandoned. This application May 6, 1976, Ser. No. 683,853
Int. Cl.² C08F *2/00, 14/06, 114/06, 214/06*
U.S. Cl. 526—88 11 Claims

1. In the process for preparation of a vinyl halide homopolymer, vinyl halide copolymer or vinyl halide graft polymer containing up to about 50% by weight of comonomer devoid of aldehyde substituents and/or a compatible back-bone polymer by bulk liquid phase polymerization which comprises:

1. polymerizing a vinyl halide monomer composition comprising 0% to about 50% by weight of said comonomer and/or said back-bone polymer at a temperature of about −60° C to about 90° C;
2. recovering the resulting vinyl halide polymer from said monomer or monomers, the improvement which comprises carrying out at least part of the polymerization in the presence of a small molecular weight-lowering amount of an aldehyde which is devoid of ethylenic and acetylenic unsaturation and which contains at least one carbon to carbon bond, whereby the molecular weight of the vinyl halide polymer product is substantially lowered without substantial lowering of the rate of conversion of vinyl halide to polymer, said amount of aldehyde being less than about 10 weight percent based on the weight of polymerization mixture.

4,060,678

CATIONIC HYDROGELS BASED ON HYDROXYALKYL ACRYLATES AND METHACRYLATES

Robert Steckler, San Diego, Calif., assignor to Plastomedical Sciences, Inc., Briarcliff Manor, N.Y.

Filed Feb. 11, 1975, Ser. No. 549,096
Int. Cl.² C08F *220/06*
U.S. Cl. 526—260 6 Claims

1. The cationic, polymeric hydrogel produced by the process which comprises simultaneously polymerizing and crosslinking a mixture consisting essentially of the following monomers;

a. about 40 to about 95 weight percent, based on the total weight of monomers of an acrylic monomer selected from the group consisting of glyceryl monoacrylates and monomethacrylates and acrylic monomers having the formula:

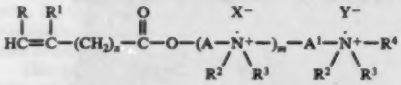
$$CH_2{=}C(R)-CO-(O-CH_2-CH(R')-)_n-OH$$

wherein:

R and R′ each represents hydrogen or lower alkyl of 1 to about 6 carbon atoms;

n represents an integer of from 1 to about 50;

b. about 50 to about 0.05 weight percent, based on the total weight of monomers, of a monoethylenically unsaturated cationic monomer, capable of copolymerizing with (a), and which is a quaternary ammonium compound having the formula:



wherein:

R represents hydrogen, methyl or aryl;

R^1 represents hydrogen or alkyl of 1 to about 18 carbons;

A and A^1, each of which may be the same or different, each represents an alkylene group of from about 2 to about 8 carbons or an arylene group;

R^2, R^3 and R^4, each of which may be the same or different, each represents alkyl, aryl or alkaryl or the R^2 and R^3 on the same nitrogen atom, taken together represent a divalent aliphatic group of 4 to 5 atoms which jointly with the amino nitrogen forms a 5 or 6 membered heterocyclic amino group;

X and Y, each of which may be the same or different, each represents an anion forming the anion portion of a quanternary ammonium group; and

n represents an integer, including 0, of from 0 to about 10; and

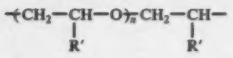
m represents an integer, including 0, of from 0 to about 5;

c. about 0.2 to about 12 weight percent, based on the total weight of monomers, of a polymerizable cross-linking agent capable of copolymerizing with (a) and (b); and having the formula:

wherein

R represents a member of the group consisting of hydrogen and alkyl of from 1 to about 4 carbon atoms;

A represents alkylene of from 2 to about 10 carbons or a polyglycol ether group of the formula:



in which

R′ represents a member of the group consisting of hydrogen and alkyl of 1 to 2 carbon atoms; and

n represents an integer of from 1 to about 20; and

(d) from 0 to about 50 weight percent, based on the total weight of monomers, of other monoethylenically unsaturated monomers capable of copolymerizing with (a), (b) and (c) and selected from the group consisting of: acrylamides, methacrylamides, alkyl acrylates, alkyl methacrylates, N-vinyl lactams, N-vinyl succinimide, N-vinyl diglycoylimide, N-vinyl glutarimide, N-vinyl-3-morpholinone, N-vinyl-5-methyl-3-morpholinone and N-vinyl imidazole;

provided that (a) ≧ (d) and (a) + (d) = about 40 to about 95 weight percent, and when an N-vinyl lactam, N-vinyl succinimide, N-vinyl diglycoylimide, N-vinyl glutarimide, N-vinyl-3-morpholinone, N-vinyl-5-methyl-3-morpholinone or N-vinyl imidazole is used it is present in an amount of less than 20 weight percent;

in the presence of a free radical polymerization catalyst in an amount of from about 0.05 to about 4 weight percent, based on the total weight of monomers; and at a temperature of from about 20° to about 125° C.

4,060,679

METHOD OF PREPARING A LOW MOLECULAR WEIGHT PAPER SIZE POLYMER BY CONTINUOUS POLYMERIZATION IN THE ABSENCE OF INITIATOR

Herbert Naarmann, Wattenheim; Fritz Reichel, Eppelheim, and Hermann Gausepohl, Mutterstadt, all of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Germany

Filed Apr. 9, 1976, Ser. No. 675,581

Claims priority, application Germany, May 2, 1975, 2519581

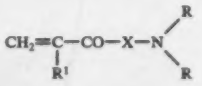
Int. Cl.² C08F *20/70, 22/58, 220/60, 226/00*

U.S. Cl. 526—304 **5 Claims**

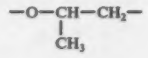
1. A process for the manufacture of a paper size by continuous polymerization of:

a. from 30 to 85 percent by weight of olefins of 2 to 12 carbon atoms having a terminal double bond selected from the group consisting of ethylene, propylene, butene-1 and 4-methylpentene-1, olefins containing aromatic group and having up to 12 carbon atoms selected from the group consisting of styrene and vinyl toluene, vinyl ethers selected from the group consisting of vinyl methyl ether, vinyl ethyl ether, vinyl n-propyl ether, vinyl isopropyl ether, vinyl n-butyl ether, vinyl sec.-butyl ether, vinyl tert.-butyl ether and vinyl dodecyl ether and mixtures thereof,

b. from 15 to 70 percent by weight of one or more basic acrylic and/or methacrylic compounds of the general formula



where R^1 is H or CH_3, R is alkyl of 1 to 4 carbon atoms, $—CH_2OH$ or $—CH_2—CH_2—OH$, X is $—O—CH_2—CH_2—$, $—O—CH_2—CH_2—CH_2—$,



or $—NH—(CH_2)_n—CH_2—$ and *n* is from 1 to 3, at from 130° to 320° C, in the absence of polymerization initiators said process taking place at a pressure of greater than 1 bar and with a residence time of from 3 to 60 minutes.

4,060,680

PRODUCTION OF ACRYLONITRILE COPOLYMERS

Brian Norman Hendy, Welwyn, England, assignor to Imperial Chemical Industries Limited, Great Britain

Filed Mar. 22, 1976, Ser. No. 668,816

Claims priority, application United Kingdom, Apr. 10, 1975, 14791/75; May 7, 1975, 19133/75

Int. Cl.² C08F *212/10*

U.S. Cl. 526—201 **9 Claims**

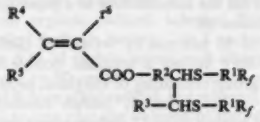
1. A granular polymerization process for producing a uniform copolymer consisting of 50–95% molar of acrylonitrile units, 5–45% molar of units of at least one faster-reacting aromatic olefin selected from the group consisting of styrene and α-methyl styrene and 0–10% of other ethylenically unsaturated monomers, said copolymer having a reduced viscosity of ≦ 0.75 determined as a 5% solution in dimethyl formamide at 25° C., said process comprising feeding a portion of at least the aromatic olefin to the reaction mixture during the polymerization so that the polymer molecules formed early in the polymerization reaction have substantially the same composition as those formed subsequently and conducting the polymerization in the presence of (a) at least one thiol as chain-transfer agent selected from the group consisting of alkane thiols containing up to 20 carbon atoms, isooctylthioglycolate, trimethylolypropane tri-(3-thiopropronate), thioethanol and α-thioglycerol, (b) a granulating agent and (c) a momomer soluble initiator, while maintaining the reaction medium at pH ≦ 4.5.

4,060,681
UNSATURATED ESTERS OF POLYFLUOROALKYLTHIOALCOHOLS

Eduard K. Kleiner, New York, and Robert Ernest Arthur Dear, Mount Kisco, both of N.Y., assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Filed Feb. 11, 1976, Ser. No. 657,140
Int. Cl.[2] C07G 69/54
U.S. Cl. 560—222 14 Claims

1. A compound of the structure

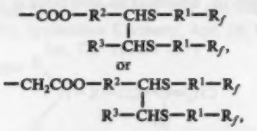


wherein

R^1, R^2 are each C_nH_{2n}, where n is 1 to 12 and may be straight chain or branched;

R^3 is hydrogen or C_nH_{2n+1}, where n is 1 to 12 and may be straight chain or branched;

R^4, R^5 and R^6 are hydrogen, methyl



provided that at least one of R^4, R^5 and R^6 is hydrogen or methyl;

R_f is C_pF_{2p+1} or $C_pF_{2p+1}OC_qF_{2q}$, where p is 3 to 18, q is 2 to 8.

4,060,682
PROCESS FOR THE SYNTHETIC PRODUCTION OF 3-DEOXY DERIVATIVE OF AN AMINOGLYCOSIDIC ANTIBIOTIC

Hamao Umezawa; Sumio Umezawa, both of Tokyo; Osamu Tsuchiya, Yokohama; Eiichi Akita, Kamakura; Takeo Miyazawa, Tokyo; Yukio Horiuchi, Yokohama, and Shunzo Fukatsu, Tokyo, all of Japan, assignors to Meiji Seika Kaisha, Ltd., Tokyo, Japan

Filed July 23, 1975, Ser. No. 598,379
Claims priority, application Japan, Aug. 1, 1974, 49-87499
Int. Cl.[2] A61K 31/71; C07H 15/22
U.S. Cl. 536—10 17 Claims

17. A compound which is selected from the group consisting of tetra-N-ethoxycarbonyl-5,6-O-cyclohexylidene-3′,4′-epoxy(α)-neamine; penta-N-ethoxycarbonyl-4″,6″-O-cyclohexylidene-3′,4′-epoxy(α)-kanamycin B; 3′,4′-epoxy(α) -kanamycin B; penta-N-ethoxycarbonyl-4″,6″-O-cyclohexylidene-3′,4′-epoxy(α)-6′-N-methylkanamycin B; 2″,3″-O-cyclohexylidene-tetra-N-ethoxycarbonyl-3′,4′-epoxy(α)-ribostamycin; and tri-N-ethoxycarbonyl-5,6-O-cyclohexylidene-3′,4′-epoxy(α)-paromamine.

4,060,683
PREPARATION OF CATIONIC STARCHES AND CATHIONIC STARCHES THUS PRODUCED

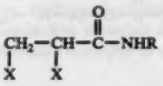
Martin M. Tessler, Edison, N.J., assignor to National Starch and Chemical Corporation, Bridgewater, N.J.

Filed Aug. 31, 1976, Ser. No. 719,266
Int. Cl.[2] C08B 31/08
U.S. Cl. 536—50 8 Claims

1. A method for the preparation of modified starch products comprising the steps of

1. reacting a starch base with a modifying agent in an aqueous medium at a pH of 10.0 to 12.5 and a temperature of 10° to 60° C. for a period of 0.2 to 16 hours, said modifying agent comprising the reaction product of

a. a 2,3-dihalopropionamide of the formula:



wherein X is a bromine or chlorine and R is hydrogen or C_1–C_8 alkyl with

b. a secondary amine of the formula

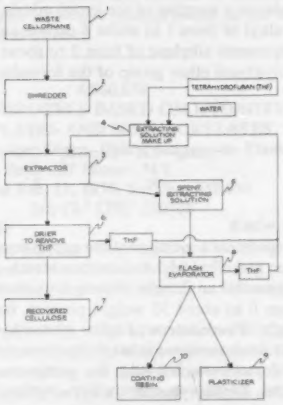
where R′ and R″ are, independently, alkyl, alkenyl, arylalkyl or ether substituted alkyl or alkenyl or wherein R′ and R″ are connected to form a cyclic amine and wherein the total number of carbon atoms in R′ and R″ combined is a maximum of 12, wherein the reaction to form said modifying agent is carried out at a temperature of 20° to 100° C, in an organic medium for a period of 10 minutes to 18 hours; and

2. isolating the resulting starch product.

4,060,684
PROCESS FOR RECOVERING RAW MATERIALS FROM WASTE CELLOPHANE

Donald Wayne Monk, Brevard, N.C., assignor to Olin Corporation, Pisgah Forest, N.C.

Filed Sept. 1, 1976, Ser. No. 719,657
Int. Cl.[2] C08B 9/08
U.S. Cl. 536—56 8 Claims



1. A process for recovering usable materials from scrap cellophane softened with a plasticizer and bearing a moisture-proof coating resin comprising:

a. shredding the cellophane to form a relatively fine flake;

b. extracting both plasticizer and coating resin by washing the cellophane flake with an aqueous solution of tetrahydrofuran containing from 2 to 15% by weight water;

c. removing the spent wash solution containing plasticizer, coating resin, tetrahydrofuran, and water and rapidly evaporating the tetrahydrofuran therefrom while concurrently allowing the coating resin to precipitate; and

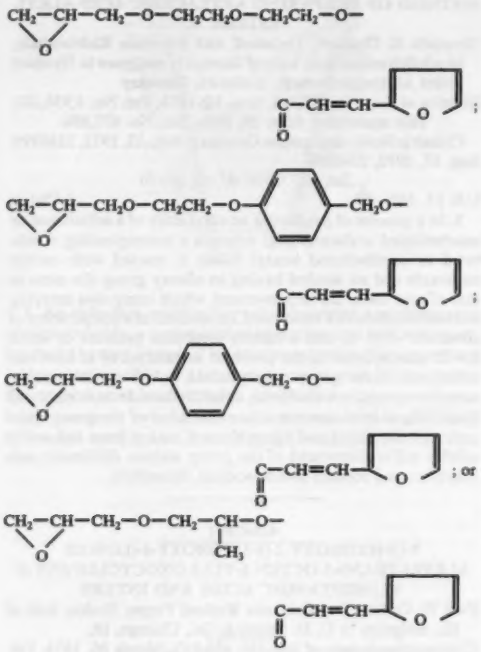
d. drying the extracted cellophane flake to remove retained tetrahydrofuran and recovering the purified cellulose.

4,060,685
FURANACROYL ESTERS

Yukio Maekawa; Masato Satomura, and Akira Umehara, all of Asaka, Japan, assignors to Fuji Photo Film Co., Ltd., Minami-ashigara, Japan

Division of Ser. No. 414,609, Nov. 8, 1973, Pat. No. 3,993,624. This application Apr. 28, 1976, Ser. No. 680,994
Claims priority, application Japan, Nov. 8, 1972, 47-111804; Feb. 17, 1973, 48-19544
Int. Cl.² C07D *407/06, 407/10, 407/12*
U.S. Cl. 542—413 5 Claims

1. A furanacroyl ester having the general formula

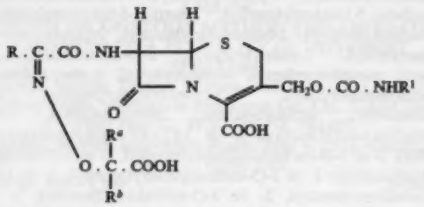


4,060,686
CEPHALOSPORINS HAVING A 7-(CARBOXY SUBSTITUTED α-ETHERIFIED OXIMINOARYLACETAMIDO) GROUP

Janice Bradshaw, 37 Hamilton Road, Harrow, Middlesex; Martin Christopher Cook, 18 Menlove Gardens South, Liverpool 18, and Gordon Ian Gregory, 18 The Paddock, Chalfont St. Peter, Buckinghamshire, all of England

Continuation-in-part of Ser. No. 533,451, Dec. 16, 1974, abandoned. This application Mar. 18, 1976, Ser. No. 668,246
Claims priority, application United Kingdom, Dec. 21, 1973, 59517/73
Int. Cl.² C07D *501/32, 501/34*
U.S. Cl. 544—22 5 Claims

1. A cephalosporin antibiotic of the formula:



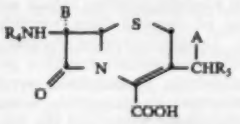
wherein
R is thienyl, furyl or phenyl;
R^a and R^b together with the carbon atom to which they are attached form a cyclobutylidene, cyclopentylidene or cyclohexylidene group; and
R^1 is hydrogen or methyl;
or a physiologically acceptable salt, ester, or 1-oxide thereof.

4,060,687
CEPHALOSPORINS HAVING A 3-α SUBSTITUTED ALKYL GROUPING

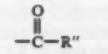
Burton G. Christensen, Metuchen, and Ronald W. Ratcliffe, Matawan, both of N.J., assignors to Merck & Co., Inc., Rahway, N.J.

Division of Ser. No. 392,159, Aug. 27, 1973, Pat. No. 3,947,413, which is a continuation-in-part of Ser. No. 314,485, Dec. 12, 1972, abandoned, and Ser. No. 306,064, Nov. 13, 1972, abandoned. This application Oct. 23, 1975, Ser. No. 625,280
Int. Cl.² C07D *501/16;* A61K *31/545*
U.S. Cl. 544—27 3 Claims

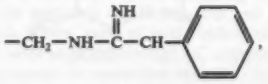
1. A compound having the structure:



wherein: R_4 is an acyl radical selected from the group consisting of:

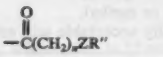


wherein: R″ is benzyl, p-hydroxybenzyl, 4-amino-4-carboxybutyl, methyl, cyanomethyl, 2-pentenyl, n-amyl, n-heptyl, ethyl, 3- or 4-nitrobenzyl, phenethyl, β,β-diphenylethyl, methyldiphenylmethyl, triphenylmethyl, 2-methoxyphenyl, 2,6-dimethoxyphenyl, 2,4,6-trimethoxyphenyl, 3,5-dimethyl-4-isoxazolyl, 3-butyl-5-methyl-4-isoxazolyl, 5-methyl-3-phenyl-4-isoxazolyl, 3-(2-chlorophenyl)-5-methyl-4-isoxazolyl, 3-(2,6-dichlorophenyl)-5-methyl-4-isoxazolyl, D-4-amino-4-carboxybutyl, D-4-N-benzoylamino-4-carboxy-n-butyl, p-aminobenzyl,



o-aminobenzyl, m-aminobenzyl, (3-pyridyl)methyl, 2-ethoxy-1-napthyl, 3-carboxy-2-quinoxalinyl, 3-(2,6-dichlorophenyl)-5-(2-furyl)-4-isoxazolyl, 3-phenyl-4-isoxazolyl, 5-methyl-3-(4-guanidinophenyl)-4-isoxazolyl, 4-guanidinomethylphenyl, 4-guanidinomethylbenzyl, 4-guanidinobenzyl, 4-guanidinophenyl, 2,6-dimethoxy-4-guanidinophenyl, o-sulfobenzyl, p-carboxymethylbenzyl, p-carbamoylmethylbenzyl, m-fluorobenzyl, m-bromobenzyl, p-chlorobenzyl, p-methoxybenzyl, 1-napthylmethyl, 3-isothiazolylmethyl, 4-isothiazolylmethyl, 5-

isothia-zolylmethyl, 4-pyridiylmethyl, 5-isoxazolylmethyl, 4-methoxy-5-isoxazolylmethyl, 4-methyl-5-isoxazolylmethyl, 1-imidazolylmethyl, 2-benzofuranylmethyl, 2-indolylmethyl, 2-phenylvinyl, 2-phenylethynyl, 2-(5-nitrofuranyl)vinyl, phenyl, o-methoxyphenyl, o-chlorophenyl, o-phenylphenyl, p-aminomethylbenzyl, 1-(5-cyanotriazolyl)methyl, difluoromethyl, dichloromethyl, dibromomethyl, 1-(3-methylimidazolyl)methyl, 2- or 3-(5-carboxymethylthienyl)-methyl, 2- or 3-(4-carbamoylthienyl)methyl, 2- or 3-(5-methylthienyl) methyl, 2- or 3-(5-methoxythienyl)methyl, 2- or 3-(4-chlorothienyl)methyl, 2- or 3-(5-sulfothienyl)methyl, 2- or 3-(5-carboxythienyl)methyl, 3-(1,2,5-thiadiazolyl) methyl, 3-(4-methoxy-1,2,5-thiadiazolyl)methyl, 2-furylmethyl, 2-(5-nitrofuryl)methyl, 3-furylmethyl, 2-thienylmethyl, 3-thienylmethyl, or tetrazolylmethyl; or the radical R_4 is represented by:



wherein n is 0–4, Z represents oxygen or sulfur, and R″ is defined above; or the radical R_4 is represented by:

wherein R″ is defined as above and R‴ is a radical selected from the group consisting of: amino, hydroxy, azido, carbamoyl, guanidino, halo, sulfamino, tetrazolyl, sulfo, and carboxy; B is hydrogen or methoxyl; R^5 is a C_1–C_3 straight or branched chain alkyl; A is a heterocyclylthio radical selected from the group consisting of: isoxazolylthio, pyrolidenylthio, 1,3,4-thiadiazolylthio, 1-oxidopyridylthio, furazanylthio, tetrazolylthio, thienylthio, thiazolylthio, furylthio, pyranylthio, pyrrolylthio, imidazolylthio, pyrazolylthio, pyridylthio, pyrazinylthio, pyrimidinylthio, pyridazinylthio, isothiazolylthio, and 1-methyl-1,2,3,4-tetrazolyl-5-thio; and the non-toxic pharmaceutically acceptable salts and esters thereof.

4,060,688

CEPHALOSPORIN INTERMEDIATES

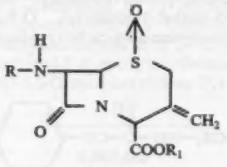
Robert R. Chauvette, Indianapolis, Ind., assignor to Eli Lilly and Company, Indianapolis, Ind.

Continuation-in-part of Ser. No. 310,191, Nov. 28, 1972, Pat. No. 3,917,587. This application June 6, 1975, Ser. No. 584,548

Int. Cl.² C07D *501/22*

U.S. Cl. 544—30 **5 Claims**

1. The compound of the formula



wherein R is phenoxyacetyl or phenylacetyl and R_1 is hydrogen, p-nitrobenzyl, p-methoxybenzyl, benzhydryl, or 2,2,2-trichloroethyl.

4,060,689

VINYLBENZYL ESTERS OF N-BOC-AMINO ACIDS

Nicholas D. Harris, Norwich, N.Y., assignor to Morton-Norwich Products, Inc., Norwich, N.Y.

Division of Ser. No. 659,967, Feb. 20, 1976. This application Dec. 17, 1976, Ser. No. 751,721

Int. Cl.² C07C *125/06*; A61K *37/02*

U.S. Cl. 560—29 **1 Claim**

1. The vinylbenzyl ester of N-tertiarybutyloxy carbonyl-O-benzyl-L-threonine.

4,060,690

METHOD OF PREPARING ARYLACETIC ACID ALKYL ESTERS

Moustafa El Chahawi, Troisdorf, and Hermann Richtzenhain, Much-Schwellenbach, both of Germany, assignors to Dynamit Nobel Aktiengesellschaft, Troisdorf, Germany

Division of Ser. No. 387,268, Aug. 10, 1973, Pat. No. 3,974,202. This application Mar. 29, 1976, Ser. No. 671,896

Claims priority, application Germany, Aug. 17, 1972, 2240399; Aug. 17, 1972, 2240398

Int. Cl.² C07C *67/36, 69/76*

U.S. Cl. 560—55 **6 Claims**

1. In a process of producing an alkyl ester of a substituted or unsubstituted arylacetic acid wherein a corresponding substituted or unsubstituted benzyl halide is reacted with carbon monoxide and an alcohol having an alkoxy group the same as that of said ester, the improvement which comprises carrying out said reaction in a basic reaction medium at a temperature of about 10°–100° C, and a carbon monoxide pressure of about 0.1–25 atmospheres in the presence as catalyst of at least one cobalt salt of the group cobalt halide, cobalt acetate, cobaltacetylacetonate, cobalt nitrate, cobalthydroxide-carbonate and $Co_2(CO)_8$, at least one metal or metal alloy of the group manganese, iron, nickel and alloys thereof, and at least one water soluble sulfur compound of the group sodium dithionate, sulfoxylates, and sodium sulfide-sodium thiosulfate.

4,060,691

7-{3-HYDROXY-2-[4-HYDROXY-4-(LOWER ALKYL)-TRANS-1-OCTEN-1-YL]-5-OXOCYCLOPENT-1-YL}HEPTANOIC ACIDS AND ESTERS

Paul W. Collins, Deerfield, and Raphael Pappo, Skokie, both of Ill., assignors to G. D. Searle & Co., Chicago, Ill.

Continuation-in-part of Ser. No. 454,913, March 26, 1974, Pat. No. 3,965,143. This application Dec. 22, 1975, Ser. No. 642,830

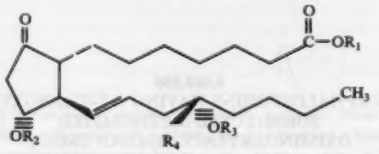
Claims priority, application South Africa, Mar. 6, 1975, 75/1391

The portion of the term of this patent subsequent to June 22, 1993, has been disclaimed.

Int. Cl.² C07C *177/00*

U.S. Cl. 560—121 **5 Claims**

1. A compound of the formula



wherein R_1 is hydrogen or lower alkyl; R_2 and R_3 are hydrogen or a lower alkanoyl, tetrahydropyran-2-yl, or tri(lower alkyl)-silyl radical; and R_4 is a lower alkyl radical.

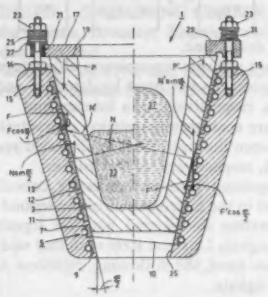
V 9 6 4 / 5 N 0 2 9 9 7 7 UMI

ELECTRICAL

4,060,692
INDUCTION MELTING FURNACE

Pieter Aart Naastepad, and Jacob Willem de Ruiter, both of Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Filed June 14, 1976, Ser. No. 695,773
Claims priority, application Netherlands, June 20, 1975, 7507358
Int. Cl.[2] H05B 5/00; F27D 11/06
U.S. Cl. 13—26 13 Claims

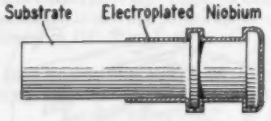


1. An induction melting furnace comprising a prefabricated conical crucible, a water-cooled induction coil and a supporting body having a conical inner circumference for supporting said conical crucible, and tensioning means arranged to subject the prefabricated crucible to an axial load during mounting to bring it under a radial compression stress and for maintaining said radial compression stress during the operation of the furnace.

4,060,693
AC SUPERCONDUCTING ARTICLES

Robert Wagner Meyerhoff, Croton-on-Hudson, N.Y., assignor to Union Carbide Corporation, New York, N.Y.

Division of Ser. No. 359,377, May 11, 1973, Pat. No. 3,906,412, which is a continuation of Ser. No. 160,926, July 8, 1971, abandoned, which is a continuation of Ser. No. 701,594, Jan. 30, 1968, abandoned. This application Aug. 7, 1975, Ser. No. 596,839
Int. Cl.[2] H01B 12/00
U.S. Cl. 174—126 S 6 Claims

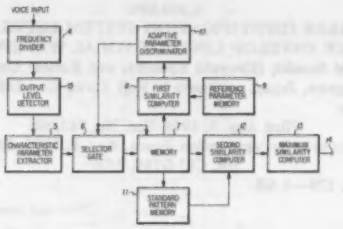


3. An AC superconducting transmission line for continuously transmitting AC power at power line frequencies with very low AC hysteretic losses which remain low even at high current density and/or high AC magnetic fields comprising: a multilayer tubular conductor wherein an outermost layer of said tubular conductor is niobium and wherein at least one other layer is of highly conductive material, said niobium layer containing oxygen in an amount less than about 50 parts per million, hydrogen in an amount less than about 1 part per million and nitrogen in an amount greater than about 1 part per million.

4,060,694
SPEECH RECOGNITION METHOD AND APPARATUS ADAPTED TO A PLURALITY OF DIFFERENT SPEAKERS

Matsumi Suzuki; Tetsuro Morino, and Shozo Yokota, all of Ebina, Japan, assignors to Fuji Xerox Co., Ltd., Tokyo, Japan

Filed May 27, 1975, Ser. No. 581,083
Claims priority, application Japan, June 4, 1974, 49-62526
Int. Cl.[2] G10L 1/02
U.S. Cl. 179—1 SD 2 Claims



1. Speech recognition method adapted to a plurality of speakers comprising the steps of

storing a plurality of reference parameters for a reference speaker where said reference parameters comprise a sentence of a predetermined vocabulary;

first extracting a characteristic parameter for each phoneme from said sentence when it is uttered by said reference speaker, and

storing a characteristic parameter corresponding to each said phoneme during said storing step where all of said characteristic parameters comprise said reference parameters and where each characteristic parameter x_i is extracted in accordance with the following equation

$$x_i = \sum_{j=1}^{n} \alpha_j F_j - \sum_{j=1}^{n} \beta_j F_j - \gamma_i$$

the foregoing equation being implemented by (a) dividing each phoneme into n frequency bands where F_j is the output of the j^{th} band, (b) respectively weighting each of the outputs the bands where the weight for the j^{th} band for x_i is α_j and the weight for a phoneme which can erroneously be recognized as x_i is β_j, (c) establishing a predetermined threshold γ_i and (d) subtracting the β_j weighted F_j outputs and γ_i from the α_j weighted F_j outputs to obtain x_i;

extracting the characteristic parameters from said sentence when uttered by an unknown speaker in accordance with the following equation

$$Y_m = \{y_m^{(k)}(t) \mid x_{1k}(t_{y_m}), x_{2k}(t_{y_m}) \ldots \ldots x_{ik}(t_{y_m})\} \quad (9)$$
wherein $m = 1, 2, \ldots g$

where $k = 0, 1, 2, \ldots p-1$, the foregoing equation being implemented by said first extracting step and $p-1$ further extracting steps where each of said further extracting step comprises the same steps (a) through (d) comprising said first extracting step except for respective variations in the values of α_j and β_j where α_{jk} is the k^{th} variation of α_j and β_{jk} is the k^{th} variation of β_j whereby p characteristic parameters are extracted for each phoneme of said sentence;

individually comparing said p characteristic parameters of each phoneme with the reference characteristic parameter extracted for said phoneme from said sentence uttered by said reference speaker;

selecting for each said phoneme the one characteristic parameter from said p characteristic parameters which most closely compares with said reference characteristic parameters,

in response to the selected characteristic parameter, selecting from the first extracting steps and said further extracting steps that extracting step which extracted the selected characteristic parameter for each phoneme whereby the selected extracting step is then employed for said unknown speaker; and

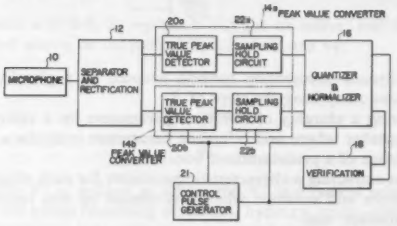
in response to the selected extracting step, utilizing the characteristic parameters of any sentence using said vocabulary uttered by said unknown speaker to effect recognition of said last-mentioned sentence.

4,060,695

SPEAKER IDENTIFICATION SYSTEM USING PEAK VALUE ENVELOP LINES OF VOCAL WAVEFORMS

Matsumi Suzuki; Hiroyuki Kataoka, and Keiichi Ueno, all of Kanagawa, Japan, assignors to Fuji Xerox Co., Ltd., Tokyo, Japan

Filed Aug. 9, 1976, Ser. No. 713,065
Claims priority, application Japan, Aug. 9, 1975, 50-97033
Int. Cl.[2] G10L *1/00*
U.S. Cl. 179—1 SB **3 Claims**



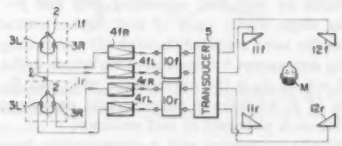
1. A voice recognition system for developing from an electrical voice signal a characteristic pattern for comparison with a stored characteristic pattern, said system comprising, means for separating said voice signal into its positive and negative polarity portions, peak follower circuit means for following the peaks of said positive and negative polarity portions, sampling means connected to said peak follower circuit means for sampling said peaks at predetermined intervals to develope positive and negative peak envelope waves, and quantizing and normalizing said positive and negative peak envelope waves, said quantized normalized positive and negative peak envelopes constituting said characteristic pattern.

4,060,696

BINAURAL FOUR-CHANNEL STEREOPHONY

Makoto Iwahara; Fumio Maruyama; Goro Fujiki; Toshinori Mori; Norio Hiyama, and Mitsuru Kikuchi, all of Yokohama, Japan, assignors to Victor Company of Japan, Limited, Japan

Filed June 17, 1976, Ser. No. 697,122
Claims priority, application Japan, June 20, 1975, 50-75209; June 24, 1975, 50-76934
Int. Cl.[2] H04R *5/00*
U.S. Cl. 179—1 GQ **11 Claims**



1. A four-channel stereophony using left and right front loudspeakers and left and right rear loudspeakers, comprising:

first and second dummy heads each simulating the human head in shape and dimensions and provided with left and right microphones mounted in positions corresponding to the ears of the human head to generate front binaural signals L*fs* and R*fs* from the first dummy head and second binaural signals L*rs* and R*rs* from the second dummy head;

means comprising a first crosstalk cancellation circuit connected to the microphones of the first dummy head for converting the first binaural signals into third binaural signals L*fsp* and R*fsp* such that said third binaural signals have the following relations to the first binaural signals:

$$\begin{bmatrix} Lfsp \\ Rfsp \end{bmatrix} = T \begin{bmatrix} a_{11}\, a_{12} \\ a_{21}\, a_{22} \end{bmatrix}^{-1} \begin{bmatrix} Lfs \\ Rfs \end{bmatrix}$$

where, T is a delay time,

a_{11} and a_{12} are acoustic transmission characteristics over the path between the left front loudspeaker and the left and right ears, respectively, of a listener; and

a_{21} and a_{22} are acoustic transmission characteristics over the path between the right front loudspeaker and the left and right ears, respectively, of the listener;

means comprising a second crosstalk cancellation circuit connected to the microphones of the second dummy head for converting the second binaural signals into fourth binaural signals L*rsp* and R*rsp* such that said fourth binaural signals have the following relations to the second binaural signals:

$$\begin{bmatrix} Lrsp \\ Rrsp \end{bmatrix} = T \begin{bmatrix} b_{11}\, b_{12} \\ b_{21}\, b_{22} \end{bmatrix}^{-1} \begin{bmatrix} Lrs \\ Rrs \end{bmatrix}$$

where, b_{11} and b_{21} are acoustic transmission characteristics over the path between the left rear loudspeaker and the left and right ears, respectively, of the listener; and

b_{12} and b_{22} are acoustic transmission characteristics over the path between the right rear loudspeaker and the left and right ears, respectively, of the listener; and

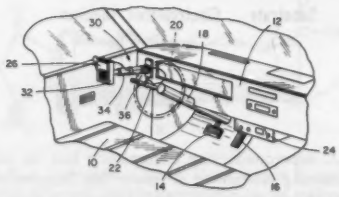
four-channel transducing means connected to the outputs from the first and second crosstalk cancellation circuit for translating the third and fourth binaural signals into reproduceable form; whereby said third and fourth binaural signal, when electroacoustically reproduced, will produce front and rear binaural effects, respectively, to said listener.

4,060,697

MICROPHONE MOUNTING AND CONTROL SYSTEM

Willie Neal, Chicago, Ill., assignor to Samuel R. Carter, Chicago, Ill., a part interest

Filed Mar. 8, 1976, Ser. No. 664,560
Int. Cl.[2] G05G *11/00*; H04R *5/02*
U.S. Cl. 179—1 VE **6 Claims**



1. Microphone mounting and control system for use in the driver's compartment of a vehicle especially adapted for operation by a handicapped person, said system being operable during operation of a vehicle and comprising a holder for a microphone, said holder having an opening in the side thereof through which a control button on a microphone positioned in said holder can extend, means for supporting said holder from

a dashboard of a vehicle and at a location within the normal voice range of an operator of the vehicle, mechanical control means on said holder for engaging the control button of a microphone in said holder, trigger means for operating said mechanical control means to depress the control button, means for mounting said trigger means on an acceleration and brake control arm extending from a steering column for steering a vehicle and means connecting said trigger means to said mechanical control means.

4,060,698

DIGITAL SWITCHING CENTER

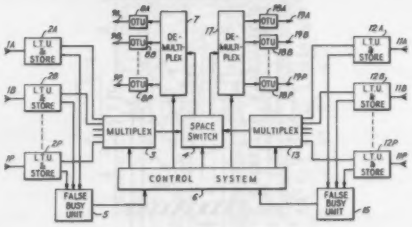
Peter Alexander Birnie, Bromley, England, assignor to Post Office, London, England

Filed May 11, 1976, Ser. No. 685,323

Claims priority, application United Kingdom, May 19, 1975, 21180/75

Int. Cl.[2] H04J 3/00

U.S. Cl. 179—15 AT **7 Claims**



1. A digital switching centre having a first set of signal stores connected to receive the signals of a set of pulse code modulation (P.C.M.) signal systems respectively, each signal store having a plurality of registers for storing signals of a respective plurality of channels of the particular PCM signal system, a control means and a switching means responsive to the control means and connected to derive signals from the signal stores of the first set at selected times so as to establish selected signal transfer paths from registers of the signal stores, wherein there is provided means responsive to signals from the particular PCM signal system for producing an indication of the time of occurrence of a selected channel of the system, the control means being responsive to the indication to prevent the establishment of a particular signal transfer path from the register for storing signals from the selected channel if that path would result in there being less than a predetermined interval of time between the reception of signals by and the derivation of signals from the register for storing signals from the selected channel.

4,060,699

LINE CONNECTION REVERSING CIRCUITS

Hisashi Ataka; Shigeo Wako, and Shintaro Ushio, all of Tokyo, Japan, assignors to Oki Electric Industry Co., Ltd., Tokyo, Japan

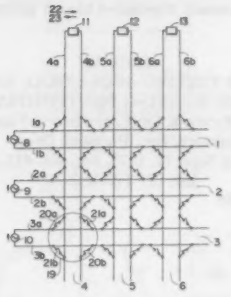
Filed Sept. 2, 1976, Ser. No. 720,080

Claims priority, application Japan, Sept. 10, 1975, 50-109015

Int. Cl.[2] H04Q 3/52

U.S. Cl. 179—18 GF **3 Claims**

1. A line connection reversing circuit comprising a first set of a plurality of paired transmission lines, a second set of a plurality of paired transmission lines crossing said first set of paired transmission lines to form a matrix, each one of said transmission lines including two conductors, first and second pairs of bidirectional semiconductor switching elements disposed at each cross-point of said matrix, one bidirectional semiconductor switching element of the first pair being connected between the first conductor of one paired transmission line of the first set and the first conductor of one paired transmission line of the second set, the other bidirectional semiconductor switching element of the first pair being connected between the second conductor of said paired transmission line of said first set and the second conductor of said paired transmission line of said second set, one bidirectional semiconductor switching element of the second pair being connected between said first conductor of said paired transmission line of said first set and said second conductor of said paired transmission line



of said second set and the other bidirectional semiconductor switching element of the second pair being connected between said second conductor of said paired transmission line of the first set and said first conductor of said paired transmission line of said second set, and means electrically coupled to said first and second pairs of semiconductor switching elements for oppositely controlling said first and second pairs of said semiconductor switching elements.

4,060,700

TWO-PARTY TELEPHONE SYSTEM

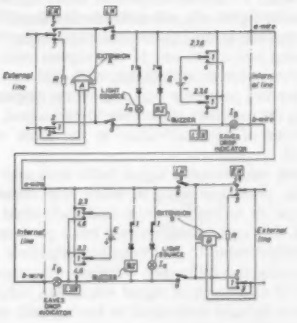
Sten Evert Magnusson, Tyreso, Sweden, assignor to Telefonaktiebolaget L M Ericsson, Stockholm, Sweden

Filed May 26, 1976, Ser. No. 690,076

Claims priority, application Sweden, June 13, 1975, 7506831

Int. Cl.[2] H04M 1/72, 9/00

U.S. Cl. 179—28 **5 Claims**



1. In a two-party telephone system utilizing a two-wire line, apparatus for enabling an external call to and from each of two telephone sets included in the system, an internal speech connection between said telephone sets and conference calls between the telephone sets and an external subscriber, said apparatus comprising, in order to achieve transmission of at least three different information conditions between said telephone sets in the system through a two-wire line, for each telephone set a control means, said control means comprising a first indicating means for busy marking connected between the conductors of said two-wire line, a voltage source, switching means for connecting said voltage source to said two-wire line

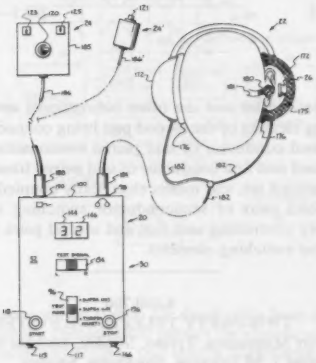
with a first and a second polarity respectively, second indicating means for receiving a calling signal connected to said two-wire line, said first indicating means being responsive to said first polarity on said line and said second indicating means being responsive to said second polarity on said line, means for connecting said voltage sources in series to said two-wire line so that an increased voltage occurs between the two conductors of said two-wire line if both telephone sets are connected to the external line, said control means furthermore comprising third indicating means responsive to said increased voltage.

4,060,701

METHOD FOR TESTING ACOUSTICAL ATTENUATION OF HEARING PROTECTORS

John M. Epley, Portland, Oreg., assignor to Hearing Evaluation & Acoustic Research, Inc., Portland, Oreg.

Filed Sept. 15, 1975, Ser. No. 613,245
Int. Cl.² H04R *29/00*
U.S. Cl. 179—175 **5 Claims**



1. A method of measuring, in the presence of significant ambient noise, the acoustical attenuation effectiveness of a hearing protector worn in operative association with an ear by a subject individual, said method comprising the steps of:

a. generating a variable-amplitude audio signal and a separate audio signal of a constant amplitude sufficiently great to be audible to said individual over said ambient noise;
b. exposing said ear to one of said signals with said hearing protector worn in association with said ear, and without said hearing protector being so worn, respectively;
c. during the exposure of said ear to said signal, exposing the other ear of said individual to the other of said audio signals;
d. varying said variable signal both with and without said hearing protector being so worn until obtaining in each instance an indication from said individual that he perceives that said variable signal has a predetermined common relationship to said constant-amplitude signal; and
e. measuring the difference between the respective amplitudes of said variable signal which are indicated in each instance by said individual as having said predetermined relationship to said constant-amplitude signal.

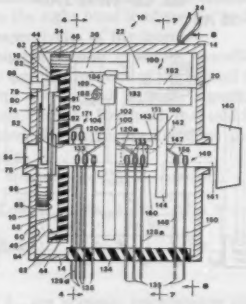
4,060,702

TIMER SWITCH ASSEMBLY HAVING ESCAPEMENT MECHANISM

Wallace Leon Linn, 6705 Grosvenor Place, Indianapolis, Ind. 46220

Filed Jan. 9, 1976, Ser. No. 647,791
Int. Cl.² H01H *7/10, 43/00*
U.S. Cl. 200—35 R **9 Claims**

1. In combination, a timer comprising a program wheel and an escapement mechanism for driving said program wheel, said escapement mechanism comprising a drive wheel rotatable about its axis and having a portion radially inwardly from its outer periphery defining a housing with an outer, generally cylindrical wall extending generally coaxially with said drive wheel, a ratchet wheel disposed for rotation on an output shaft, said ratchet wheel being disposed concentrically within said housing, a pawl for engaging said ratchet wheel, said pawl being disposed within said housing, means for providing a camming surface, said camming surface means projecting peripherally and radially inwardly toward said axis from said housing wall, means for following said camming surface, and means for urging said following means into contact with said camming surface, said following means being coupled to said pawl to move said pawl a distance determined by said camming surface in a first direction and to allow said pawl to engage said ratchet wheel and to return the same distance in a second and opposite direction to advance said ratchet wheel



and output shaft a predetermined amount in response to rotation of said drive wheel, and said output shaft driving said program wheel.

5. The invention of claim 1 wherein said program wheel is mounted upon said output shaft and comprises an axially narrow disc-shaped wheel having two opposite, axially facing surfaces, each of said surfaces having a plurality of program control surfaces disposed thereon concentric with the program wheel axis, and an array of switches associated with each of said opposite program wheel surfaces, each of said switches having an axially extending portion engaging one of said program control surfaces, each said axially extending portion extending a distance substantially equal to the axially narrow dimension of said program wheel, and said drive wheel housing extending axially a distance substantially equal to said axially narrow dimension, said combination thereby forming an axially narrow assembly.

4,060,703

KEYBOARD SWITCH ASSEMBLY WITH TACTILE FEEDBACK HAVING ILLUMINATED LAMINATED LAYERS INCLUDING OPAQUE OR TRANSPARENT CONDUCTIVE LAYER

Seth Leroy Everett, Jr., 196 Priscilla Drive, Lincroft, N.J. 07738

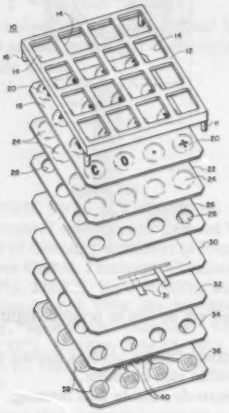
Filed Nov. 10, 1976, Ser. No. 740,567
Int. Cl.² H01H *13/70, 9/00*
U.S. Cl. 200—5 A **14 Claims**

1. A sandwich type computer keyboard comprising:

a bezel having parallel arranged apertures;
a first mylar sheet having a raised tactile bubbled surface, the bubbles being arranged and spaced to correspond to said apertures and dimensioned to pass through said apertures and extend beyond the upper bezel surface;
a flexible electroluminescent panel;
a flexible electrical conductive sheet adjacent said electroluminescent panel;

a first apertured insulator sheet intermediate said electroluminescent panel and said first mylar sheet;
a printed circuit board having respective conductors thereon arranged to be aligned and correspond with the tactile bubbled surface on said first mylar sheet; and
a second apertured insulator sheet intermediate said conductive sheet and said printed circuit board;
the apertures in said first and second insulator sheets being aligned with and corresponding to the tactile bubbled surface on said first mylar sheet.

10. A sandwich type computer keyboard comprising:
a bezel having parallel arranged apertures;
a first mylar sheet having a raised tactile bubbled surface, the bubbles being arranged and spaced to correspond to said apertures and dimensioned to pass through said apertures and extend beyond the upper bezel surface;



a stiffener sheet having a tactile bubbled surface nestled within the concave surface of each of the bubbles on said first mylar sheet;
a transparent electrical conductive coating on the concave surfaces of the bubbles on said stiffener sheet;
a light transmissive printed circuit sheet having respective transparent conductors thereon arranged to correspond with the tactile bubbled surface on said first mylar sheet;
an apertured insulator spacer sheet intermediate said printed circuit sheet and said stiffener sheet;
the apertures in said insulator spacer sheet corresponding to the tactile bubbled surface of said first mylar sheet;
and an electroluminescent panel proximal said printed circuit sheet.

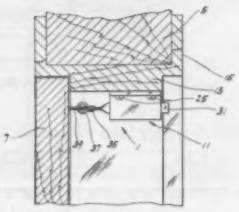
4,060,704

ALARM SWITCH HAVING RESILIENT GRIPPING STRUCTURE FOR SENSING UNAUTHORIZED MOVEMENT OF A DOOR

Donald G. Cole, Springfield, Mo., assignor to Silent Sentry, Inc., Springfield, Mo.

Filed Feb. 17, 1976, Ser. No. 658,240
Int. Cl.² H01H 3/16
U.S. Cl. 200—61.62 **4 Claims**

1. An alarm switch mounted by means of a support for actuation by relative movement between the support and a member such as a door or window comprising:
switching means carried by the support;
an operating arm for the switching means extending from the support and carried thereby, said arm being adapted to be pulled a limited distance relative to the support for actuating the switching means to complete an alarm circuit; and
interengageable gripping members on the arm and said member for pulling the arm said limited distance relative to the support to actuate the switching means when there is relative movement between the member and the support, and said gripping members automatically disengaging to free the member from the arm when the relative movement between the member and the support is greater than said limited distance, said gripping members being selectively disengageable to permit relative movement between the support and said member without actuating the



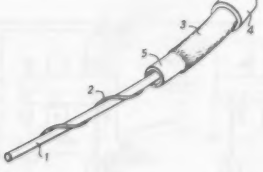
alarm switch, said switching means comprising at least one switch having an operating member adapted to be pushed in to close the switch and to be pushed in again to open the switch, said arm being engageable with said operating member to push it in to close the switch when said member moves relative to the support, the gripping members then disengaging and the switch remaining closed.

4,060,705

PRESSURE ACTUATED CONTINUOUS SWITCH

Cyril John Peachey, Crawley, England, assignor to Cyril John Peachey and Gwendoline Nora Peachey, both of Crawley, England

Filed Apr. 7, 1976, Ser. No. 674,313
Claims priority, application United Kingdom, Apr. 9, 1975, 14639/75
Int. Cl.² H01H 3/14, 9/54
U.S. Cl. 200—153 M **9 Claims**



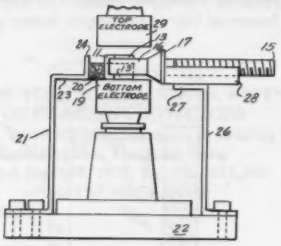
1. A pressure actuated continuous switch comprising a central conductor, a filament of insulating material helically wound around the central conductor with empty spaces between the turns of said filament, a braided flexible tubular outer conductor coaxial with and surrounding the central conductor, and a flexible sheath of semiconductive material interposed between the insulating material and the outer conductor, whereby the conductors are normally insulated from one another by the helically wound filament of insulating material, and when pressure is applied to the assembly, the conductors are deformed into at least one of said empty spaces and are electrically connected through said flexible sheath.

4,060,706

METHOD OF FORMING A HANDLE BY WELDING

Albert J. Karls, Greenville, Miss., assignor to Moeller Manufacturing Company, Inc., Greenville, Miss.

Filed Jan. 10, 1975, Ser. No. 540,174
Int. Cl.² B23K 11/02
U.S. Cl. 219—107 10 Claims



1. A method of forming and mounting a handle comprising the steps of:

a. Providing a flat sheet of weldable metal with narrow, opposed imperforate flat lugs projecting from the midportions of the opposite side edges of the sheet;

b. Forming the sheet into a channel with said lugs extending coplanar with the channel sides parallel to each other;

c. Extending the end portion of a weldable cylindrical rod between said lugs perpendicularly to the channel to bring the end of the rod substantially into abutment with the web of the channel with diametrically opposite sides of the rod in tangential surface contact with the inside surfaces of the lugs; and

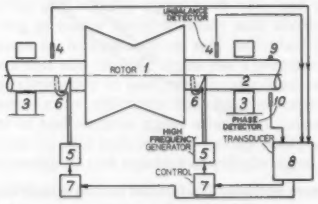
d. Fusing the rod to said inside surfaces to form rigid bonds therewith.

4,060,707

BALANCING DEVICE AND METHOD FOR A ROTATING BODY

Karl Olof Olsson, and Jörgen Wildheim, both of Finspong, Sweden, assignors to Stal-Laval Turbin AB, Vasteras, Sweden

Filed Mar. 3, 1976, Ser. No. 663,588
Claims priority, application Sweden, Mar. 6, 1975, 7502480
Int. Cl.² B23K 27/00
U.S. Cl. 219—121 LM 9 Claims



6. A method for balancing a rotating body while in operation by local asymmetric heating and thus thermal deformation of its axis, comprising the steps of:

a. detecting phase and amount of an unbalance in said body,

b. converting said detected unbalance into a phase and amount responsive signal, and

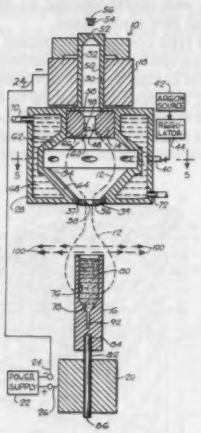
c. asymmetrically heating predetermined parts of said rotating body in dependence on said signal, by local application of energy pulses without removing material from said body.

4,060,708

METASTABLE ARGON STABILIZED ARC DEVICES FOR SPECTROSCOPIC ANALYSIS

John P. Walters, Madison, Wis., assignor to Wisconsin Alumni Research Foundation, Madison, Wis.

Filed Sept. 17, 1975, Ser. No. 614,194
Int. Cl.² B23K 9/00
U.S. Cl. 219—121 P 23 Claims



1. A stabilized arc device to produce light for spectroscopic analysis,

said device comprising a housing having a chamber therein,

a cathode within said chamber,

an anode electrode outside said housing,

direct current electrical power supply means having positive and negative terminals connected to said respective anode and cathode electrodes,

gas supply means for introducing a pressurized stabilizing gas into said chamber,

a nozzle electrode having a gas discharge orifice therein and disposed on said housing for discharging a stream of the stabilizing gas from said chamber to said anode electrode to stabilize an electrical arc between said cathode and anode electrodes,

said nozzle electrode being made of an electrically conductive material,

and electrically insulating means for insulating said nozzle electrode from said housing and also from said cathode and anode electrodes whereby said nozzle electrode can assume an intermediate electrical potential between the electrical potentials of said cathode and anode electrodes,

said anode electrode having receptacle means for holding a sample material to be vaporized by the arc to produce light for spectroscopic analysis.

4,060,709

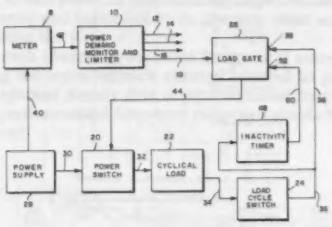
POWER SUPPLY CONTROL

Charles G. Hanson, 10915 Beechwood Drive, Indianapolis, Ind. 46280

Filed Apr. 28, 1976, Ser. No. 681,125
Int. Cl.² B23K 9/10
U.S. Cl. 219—131 R 10 Claims

1. Apparatus for controlling the supply of power to a selected load of a number of cyclical, separately controllable loads, comprising a controllable switch for opening the power supply circuit to the selected load, first means for sensing the amount of power being consumed by the loads and for generating a first signal to indicate that the supply of power to the selected load is to be interrupted, second means for sensing the completion of an operating cycle of the selected load and for

generating a second signal in response thereto, and gate means for allowing the first sensing means to pass said first signal to cause said controllable switch to interrupt the power supply to



the selected load only after the second signal has been generated, the first and second means and controllable switch being coupled to the gate means.

4,060,710

RIGID ELECTRIC SURFACE HEATING ELEMENT

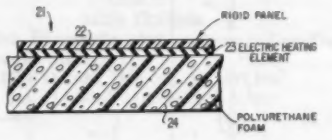
Franz Gottfried Reuter, Lemforde, and Tankred Walter Menzel, Bad Essen, both of Germany, assignors to Reuter Maschinen- and Werkzeugbau GmbH, Lemforde, Germany

Division of Ser. No. 292,321, Sept. 26, 1972, abandoned. This application Sept. 9, 1974, Ser. No. 504,192

Claims priority, application Germany, Sept. 27, 1971, 2148191; Oct. 16, 1971, 2151626; July 12, 1972, 2234216

Int. Cl.[2] H05B *3/22;* **H01B** *1/06;* **H01C** *1/012;* **F24D** *13/02*

U.S. Cl. 219—548 **7 Claims**



1. A rigid surface heating element heated by electricity and consisting of

a thin, rigid, heat-resistant, electrically insulating, air impervious layer for emitting heat, connected by means of an electrically conducting film provided with corresponding electrodes and electrical connectors to a thicker, rigid, air impervious electrically insulating polyurethane foam layer, said heating element being prepared by

mounting said electrodes on said thin, rigid, heat-resistant, electrically insulating, air impervious, heat emitting layer,

depositing an aqueous plastic dispersion consisting essentially of a synthetic resin, electrically conducting particles, and an alkai silicate selected from the group consisting of potassium silicate and sodium silicate in an amount sufficient to provide homogeneous voltage potential properties to form said electrically conducting film over said electrodes and heat emitting layer,

drying said film, and

depositing said thicker, air impervious, heat insulating, polyurethane resin foam layer over the entire surface of said film by bringing a foam-forming reaction mixture into direct contact with the previously deposited electrically conducting film, said silicates being present in said heating film in sufficient quantity to protect said heating film from attack by the starting reaction components of the polyurethane resin.

4,060,711

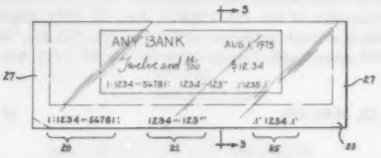
DOCUMENT CARRIER

Melvin S. Buros, Phoenix, Ariz., assignor to Micr-Shield Company, Phoenix, Ariz.

Filed Sept. 17, 1975, Ser. No. 614,332

Int. Cl.[2] G06K *19/00*

U.S. Cl. 235—488 **9 Claims**



1. A document carrier for enclosing a document to be machine-processed comprising:

a. a first single, flat substantially rectangular sheet of material having a layer of cohesive material on one surface thereof, said layer of cohesive material capable of adhering only to a similar layer of cohesive material;

b. a second single, flat substantially rectangular sheet of material having a layer of said cohesive material on one surface thereof;

c. said sheets having substantially the same length and width and being sufficiently translucent or transparent to permit optical recognition of the information on said document when it is placed between said sheets;

d. said cohesive layers surrounding said document and coming into contact with each other and with said document when said sheets are placed on opposite sides of said document to encase said document and to render said document immovable within said carrier, each of said sheets adhering only to each other and not to said document; and

e. one of said sheets having a magnetic ink-receiving surface along one edge thereof on the surface thereof opposite said cohesive material.

4,060,712

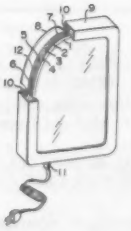
NON-CONDENSATION MIRROR

Yun-Te Chang, 47, Li Te 11 Road, Lin 8, Ta Te Li Tainan, China /Taiwan

Filed Dec. 23, 1976, Ser. No. 753,864

Int. Cl.[2] H05B *1/00*

U.S. Cl. 219—219 **4 Claims**



1. A non-condensation mirror assembly adapted to be mounted generally vertically in a bathroom or like space wherein there is a relatively high concentration of water particles in the air, said assembly comprising a mirror consisting of a transparent glass plate having a light reflecting layer on its rear surface, and electrical heating means at said rear surface for heating the front surface of said mirror higher than the dew point of the air in said space, said heating means extending substantially coextensively with said mirror and being so constructed and arranged that more heat is imparted therefrom to

the bottom portion of the front surface of said glass plate than to the upper portion.

4,060,713

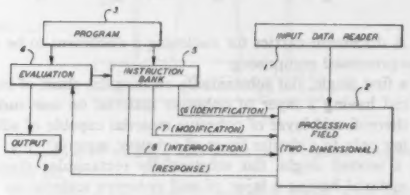
ANALYSIS OF IMAGES

Marcel J. E. Golay, Lutry, Switzerland, assignor to The Perkin-Elmer Corporation, Norwalk, Conn.

Continuation of Ser. No. 155,874, June 23, 1971, abandoned, which is a continuation-in-part of Ser. No. 803,004, Feb. 27, 1969, abandoned. This application July 14, 1975, Ser. No. 595,795

Int. Cl.[2] G06F *15/42*

U.S. Cl. 364—416 **16 Claims**



1. Apparatus for analyzing two dimensional image comprising:

a. means for converting the image to a binary image which is defined by a first field of image elements with each image element surrounded by six other elements;

b. means for storing representations of the binary image elements of said first field;

c. means for determining with respect to each element which is not at the edge of the field the pattern of the actual states of the six neighboring elements surrounding it;

d. means for comparing said pattern of states of said neighboring elements surrounding the respective element with at least one of the possible alternative patterns of states of said six neighboring elements;

e. means for fixing each element in said first field in a predetermined state when correspondence is found between the patterns of states of the neighboring elements surrounding its corresponding element in the first field of elements between the pattern of states of said neighboring elements and one of said possible patterns with which it is compared; and

f. means for providing an output representative of the state of the elements of said first field after fixing.

4,060,714

INPUT SENSOR CIRCUIT FOR A DIGITAL ENGINE CONTROLLER

John P. Lappington, Huntsville, and Leroy Shafer, Toney, both of Ala., assignors to Chrysler Corporation, Highland Park, Mich.

Filed May 20, 1976, Ser. No. 688,217

Int. Cl.[2] F02P *5/04*; G06F *15/20*; G06G *7/70*

U.S. Cl. 364—431 **26 Claims**

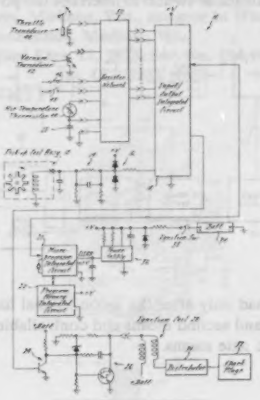
16. In an engine having an electronic control system which monitors a plurality of inputs and which in turns controls an event associated with operation of the engine, the improvement comprising:

a plurality of sensing circuits each of which is characterized by its own first order differential equation and exhibiting its own time constant which is representative of a corresponding input condition useful in controlling said event;

means for sampling the time constant of each of said sensing circuits by means of multiplexing;

a digital counter circuit;

means for causing said digital counter circuit to provide a binary word output representative of the time constant of each sensing circuit as it is sampled; and



utilization means for utilizing the binary word outputs in controlling said event.

4,060,715

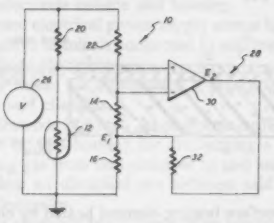
LINEARIZED BRIDGE CIRCUITRY

Larkin B. Scott, Fort Worth, Tex., assignor to The Perkin-Elmer Corporation, Norwalk, Conn.

Filed July 16, 1976, Ser. No. 705,993

Int. Cl.[2] G01K *7/24*; G06G *7/16*

U.S. Cl. 364—557 **9 Claims**



1. In a linearized bridge circuit of the type wherein a sensor presenting a resistance related to a parameter by a second order polynomial is disposed in the unknown leg and a voltage divider is disposed in the balance leg, the improvement comprising:

circuit means for continuously balancing the bridge circuit with feedback from across the conventional null measurement terminals thereof to a voltage divided point in the balance leg thereof, the voltage at said point divided by the current level of said feedback having substantially a linear relationship to the parameter of the sensor.

4,060,716

METHOD AND APPARATUS FOR AUTOMATIC ABNORMAL EVENTS MONITOR IN OPERATING PLANTS

Paul J. Pekrul, Canoga Park, and Alfred W. Thiele, Woodland Hills, both of Calif., assignors to Rockwell International Corporation, El Segundo, Calif.

Filed May 19, 1975, Ser. No. 578,558

Int. Cl.[2] G21C *17/00*

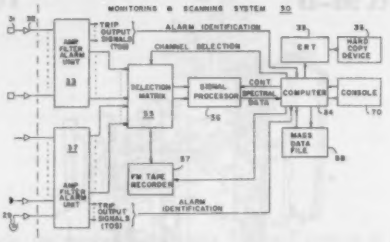
U.S. Cl. 364—576 **20 Claims**

1. In an operating plant having significant background noise in time dependent fluctuating signals derived from sensors

placed at selected points for continually monitoring the operating conditions of system components, a method for scanning in real-time separate signal conditioning channels, one for each of said signals, to find potential malfunctions, draw conclusions as to their severity and indicating to an operator what action to take comprising the steps of:

selecting each channel in sequence for spectral analysis;

processing the signal of each channel selected to produce power spectral density data at predetermined frequencies over a predetermined frequency range as a simple Fourier transform;



comparing said power spectral density data of each channel with predetermined sets of frequency dependent limits, each set consisting of at least two limits, one for a condition requiring caution, and another for an alarm condition requiring more direct action by the operator; and

indicating to the operator the condition of plant components associated with each channel and the action to be taken as a function of which set of limits and which limit of the set is exceeded by said power spectral data.

4,060,717

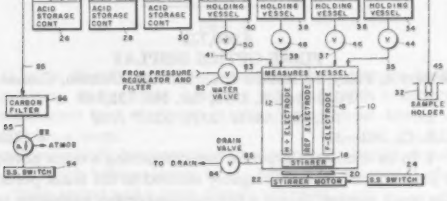
ACID TESTER

George J. Sitek, Stevensville, Mich., assignor to Leco Corporation, St. Joseph, Mich.

Filed Oct. 30, 1975, Ser. No. 627,194

Int. Cl.[2] G06F *15/20*; G01N *27/26*

U.S. Cl. 364—497 **21 Claims**



1. An acid testing instrument for use in combination with electrodes which are fluoride ion and hydrogen ion selective for determining the constituent acid concentrations in a bath including hydrofluoric and another acid having free hydrogen ions comprising:

circuit means coupled to said electrodes for providing digital output signals representative of the ion concentration detected by said electrodes;

a microprocessor and interface circuit means coupled to said microprocessor for handling input and output data and control signals to and from said microprocessor, said microprocessor coupled to said circuit means for receiving said digital output signals wherein said microprocessor includes a central processing unit (CPU) and storage means, a read-only memory and a switch multiplexer having operator actuated digital switches therein permitting the operator to select system parameters for controlling said CPU to correlate and process said digital output signals in a predetermined manner to provide display output signals representative of the concentration of acids being tested; and

display means coupled to said interface circuit means for receiving and displaying said display output signals as acid concentrations.

4,060,718

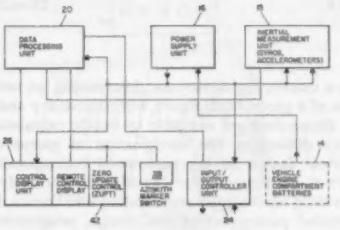
GEODETIC SURVEY METHOD

James R. Huddle, Chatsworth, Calif., assignor to Litton Systems, Inc., Woodland Hills, Calif.

Filed Dec. 10, 1976, Ser. No. 749,356

Int. Cl.[2] G01V *7/06*; G06F *15/50*

U.S. Cl. 364—421 **7 Claims**



1. A geodetic survey method using an inertial surveying system mounted in a vehicle which may be periodically stopped or brought to a substantially fixed position relative to the earth, comprising the steps of:

calibrating the system while the vehicle is in a fixed position including biasing the inertial system platform gyros and aligning the system accelerometers with the local coordinates;

at a first control point having a known location and a known deflection of the vertical, recording the surveying system indicated position, and recording the output from the inertial system sensing units, as required for determining the deflection of the vertical;

moving the vehicle along the terrain to be surveyed;

stopping the vehicle, at points which are to be surveyed, and at time intervals not to exceed the survey limit time interval, and eliminating accumulated errors from said system;

at all stops recording position including latitude, longitude, elevation, and the output from inertial system sensing units as required for determining the deflection of vertical, without releveling the inertial platform;

proceeding to a control point having a known location and known deflection of the vertical to take a second control point indication reading, and recording the inertial surveying system indicated position with regard to latitude, longitude elevation, and recording the output from the inertial system sensing units as required for determining the deflection of the vertical;

determining the position errors in latitude, longitude and elevation between the first and second control point indication readings;

recalculating the position of the intermediate survey points, utilizing the position errors between the two control point readings;

determining the error in the deflection of the vertical between the first and second control point indication readings; and

calculating the deflection of the vertical at the intermediate survey points, utilizing the error in the change in the

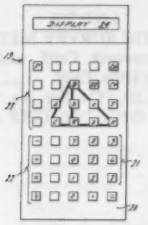
deflection of the vertical between the two control point readings.

4,060,719

COMPUTER FOR SOLVING UNKNOWN PARAMETERS OF GEOMETRICAL FIGURES

Alfred A. Dalinowski, 36244 English Drive, Sterling Heights, Mich. 48077

Filed July 23, 1976, Ser. No. 708,105
Int. Cl.² G06F *7/38*
U.S. Cl. 364—729 **10 Claims**



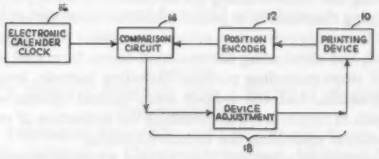
1. In a calculating device for determining an unknown dimension of a geometrical figure when necessary and sufficient known dimensions are available to enable calculation of said unknown dimension, the combination of means defining a geometrical design having parameters corresponding to parameters of said figure, a plurality of keys selectively operative for providing input signals representing said known dimensions and selected parameters of said design, programmed means responsive to said input signals for providing an output signal representing said unknown dimension, and display means responsive to said output signal for displaying said unknown dimension.

4,060,720

DATE PRINTING DEVICE WITH ELECTRONIC CALENDAR CLOCK

Frank Thomas Check, Jr., Orange, Conn., assignor to Pitney Bowes Inc., Stamford, Conn.

Filed Dec. 17, 1975, Ser. No. 641,488
Int. Cl.² G06F *11/00*; G07C *1/30*
U.S. Cl. 235—309 **10 Claims**



1. For use with a date printing device capable of printing symbols representing the days of the month, a date checking system comprising;

a. clock means for generating sets of electrical signals, each set representing a particular day of a calendar month;

b. an encoder associated with the date printing device for generating a set of electrical signals representing the current setting of the device;

c. means connected to said clock means and said encoder for comparing the clock-generated signals with the encoder-generated signals;

d. means responsive to the output of said comparing means for indicating a mismatch condition between the compared signals; and

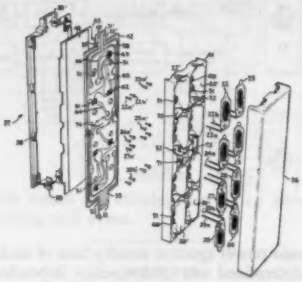
e. means for coupling said comparing means to the date printing device, said coupling means being responsive to a mismatch signal to adjust the setting of the date printing device in increments until the mismatch condition has disappeared.

4,060,721

PHOTOFLASH LAMP ARRAY HAVING CONDUCTIVE REFLECTOR

James M. Hanson, Euclid, and Gerald W. Povall, Highland Heights, both of Ohio, assignors to General Electric Company, Schenectady, N.Y.

Filed Feb. 4, 1976, Ser. No. 655,055
Int. Cl.² G03B *15/02*
U.S. Cl. 362—13 **9 Claims**



1. A multiple flash lamp array comprising a plurality of electrically fired flash lamps each having a pair of lead-in conductors, a circuit board containing thereon circuitry for sequentially firing said flash lamps, means electrically connecting said lead-in conductors of the flash lamps to said circuitry, a reflector unit positioned between said lamps and said circuit board and shaped to define individual concave reflectors on the front thereof for reflecting light from said lamps frontwardly of the array when flashed, said reflector unit comprising electrically insulating material having a coating of electrically conductive material on the front surface thereof, and an electrical ground conductive area carried on the front of said circuit board, wherein the improvement comprises a tab integral with said reflector unit and resiliently engaging against said electrical ground conductive area, said conductive coating on the reflector unit extending to the back of said tab thereby providing an electrical connection between said electrical ground conductive area and said conductive coating on the front of the reflector unit.

4,060,722

FIBRE OPTICS DISPLAY

Robert A. Foley, 75 Rollins Ave., Bellville, Ontario, Canada

Filed Sept. 8, 1976, Ser. No. 721,348
Int. Cl.² A47G *33/16*; F21P *1/02*
U.S. Cl. 362—32 **6 Claims**

1. In an artificial Christmas tree comprising a trunk portion, a plurality of branches hingably secured to the trunk portion, the trunk portion having a hollow passageway extending substantially along the length thereof, the improvement comprising:

a. a plurality of fibre optic filaments having first ends of each closely positioned one another to form a light receiving termination thereof, the termination being disposed within the passageway adjacent the base of the trunk portion, the plurality of filaments forming a quantity of sub-pluralities of filaments, one of the sub-plurality of filaments comprising a bundle passing through an orifice communicating to the passageway and being disposed located adjacent each root of each branch, means to clamp each bundle at each orifice, the other ends of the plurality of filaments being

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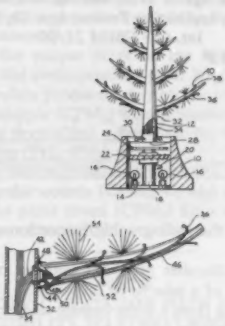
disposed distributed along the length of the plurality of branches; and

b. a tree trunk base supporting structure having a receptacle fixedly secured at the upper end thereof, the base of the trunk portion being removably secured within the recep-



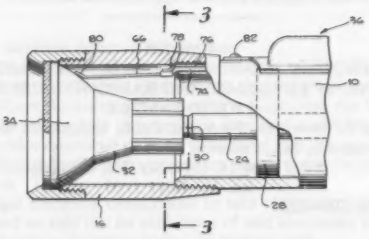
tacle, the receptacle disposing the trunk portion in substantially vertical alignment, the supporting structure comprising a housing, a lamp being disposed within the housing, the lamp being disposed producing rays of light communicating through a port in the housing to the light receiving termination of the plurality of filaments.

4,060,723

FLASHLIGHT ASSEMBLY

Norman C. Nelson, Barstow, Calif., assignor to Kel-Lite Industries, Inc., Barstow, Calif.

Filed Jan. 15, 1976, Ser. No. 649,404
Int. Cl.² H01H *3/40;* F21V *23/04*
U.S. Cl. 362—205 **1 Claim**



1. In an electric battery powered flashlight, a main body comprising an enclosure having a side wall with a battery compartment and a separated lamp compartment having a socket for a lamp,

said main body incorporating portions of an electric circuit of which battery means in the battery compartment, the lamp socket and a lamp therein are parts,

switch means in said circuit including contact means, one of which is movable relative to another to make and break said circuit,

a connection for establishing said circuit between said switch means and one of said lamp and socket, said contact means being carried by said main body outside said battery compartment, said connection between said switch means and one of said lamp and socket means also being carried by the main body outside said battery compartment and extending into said lamp compartment, the main body enclosure being tubular and having first and second separable cylindrical sections,

the first section having a male portion with threads and having a longitudinal relief through and deeper than the threads,

said connection for establishing said circuit between said switch means and said one of said lamp and socket being located in said relief below the bottoms of said threads,

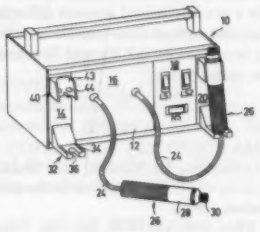
and said second section having an opening with female threads therein and into which the male portion is threaded with said connection in the relief.

4,060,724

MOUNTING APPARATUS FOR OPTICAL EXAMINATION DEVICES CONNECTED TO A PROJECTOR THROUGH A LIGHT-CONDUCTING CABLE

Helmut A. Heine; Otto H. Schmidt, both of Herrsching, and Helmut W. Rosenbusch, Weilheim, all of Germany, assignors to Propper Manufacturing Company, Inc., Long Island City, N.Y. and Optotechnik Heine KG, Herrsching, Germany

Filed July 8, 1976, Ser. No. 703,365
Claims priority, application Germany, July 24, 1975, 2533145
Int. Cl.² F21L *15/16*
U.S. Cl. 362—32 **8 Claims**



1. A mounting apparatus for an optical examination instrument, said instrument being connected at the distal end of a light-conducting cable coupled to a source of light at its near end, said apparatus comprising:

a lower mount adapted to support said instrument at the lower end thereof, said lower mount having a slit therein for the passage of said light-conducting cable; and

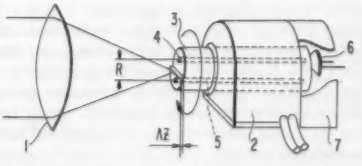
an upper mount serving as a holding device for said instrument, the end of said instrument connected to said light-conducting cable being supported on said lower mount, and an upper portion of said instrument being held in said upper mount.

4,060,725

FOCAL PLANE DETECTING DEVICE

Shuji Hoshika, Wako, Japan, assignor to Asahi Kogaku Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Mar. 16, 1976, Ser. No. 667,320
Claims priority, application Japan, Mar. 17, 1975, 50-32027
Int. Cl.² G02B *5/14;* H01J *5/16, 39/12*
U.S. Cl. 250—227 **10 Claims**



1. Apparatus for developing a signal indicative of the contrast of an image of scene, said apparatus comprising a motor having a rotary body having first and second ends and a means for imparting rotation to said rotary body about a rotary axis,

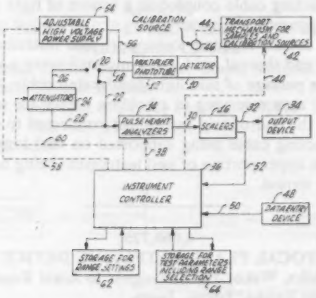
the first said end of said rotary body being adapted to have an image plane of a scene impinging thereon, optical fiber means positioned within said rotary body and extending generally in the direction of said rotary axis from said first end to said second end of said rotary body, the first and second ends of said optical fiber means being in light communication with the area just outside the first and second ends of said rotary body, whereby light in an image plane falling on said first end of said optical fiber is carried to the second end and directed outwardly of said second end of said optical fiber and said rotary body, the said first end of said optical fiber means being displaced from said axis of rotation to effect a circular scan of said image plane as said rotary body rotates, and photoconductor means positioned rearwardly of and stationary relative to said second end of said optical fiber means and said rotary body means for developing an electrical signal dependent upon the scene brightness in the image plane scanned circuit means separating and integrating said electrical signal for developing a further signal indicative of the contrast of said image, said optical fiber means comprising at least a first and a second optical fiber bundle, the first ends of both said optical fiber bundles being positioned symmetrically about said rotary axis, and the first end of said first optical fiber bundle being displaced axially a predetermined amount ΔZ relative to the first end of said second optical fiber bundle to effect scans of two image planes separated by ΔZ by said first and second optical fiber bundles, respectively.

4,060,726

GAMMA COUNTER CALIBRATION SYSTEM

Samuel H. Luitwieler, La Mirada, and Donald L. Horrocks, Placentia, both of Calif., assignors to Beckman Instruments, Inc., Fullerton, Calif.

Filed Oct. 18, 1976, Ser. No. 733,605
Int. Cl.² G01D *18/00*
U.S. Cl. 250—252 **10 Claims**



1. A method of calibration of a gamma counter having a detector and multiplier phototube means for the detection of gamma radiation, said method comprising the steps of:

placing a calibration source in an operative relationship with the detector, the calibration source being an emitter of gamma rays at a known energy level;

adjusting a setting of overall signal gain provided by the multiplier phototube means until pulses output therefrom have a pulse height which bears the same ratio to a maximum detectable pulse height as the known energy level bears to a desired maximum detectable energy level;

storing the setting obtained at the conclusion of said adjusting step; and

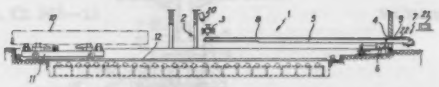
repeating said adjusting and storing steps for other desired maximum detectable energy levels, whereby each setting so obtained and stored may be retrieved and reapplied to select any of a plurality of desired detectable energy ranges.

4,060,727

METHOD AND APPARATUS FOR THE RADIOGRAPHIC INSPECTION OF TUBES

Jacques Verdickt, Dunkerque, France, assignor to Vallourec (Usines a Tubes de Lorraine-Escaut et Vallourec Reunies), Paris, France

Filed Apr. 5, 1976, Ser. No. 673,481
Claims priority, application France, Apr. 10, 1975, 75.11220
Int. Cl.² G01M *21/00*
U.S. Cl. 250—358 P **7 Claims**



1. Device for the radiographic inspection of tubes which comprises:

an elongated chamber provided with an opening for the introduction of a tube to be inspected;

a rod projecting from a point outside said chamber into said chamber opposite said opening and extending substantially the full length of the chamber, said rod being provided with means for guiding a mobile film support along the rod;

a radiation emitter positioned inside the chamber;

tube-transporting means for bringing a tube to be inspected from outside the chamber through said opening so as to encircle the rod, said tube transporting means comprising at least one carriage movable on guide rails and carrying means for rotating the tube about its own axis;

control means for said tube-transporting means adapted to be actuated from outside the chamber to immobilize said tube transporting means when a selected zone of the tube is opposite the radiation emitter;

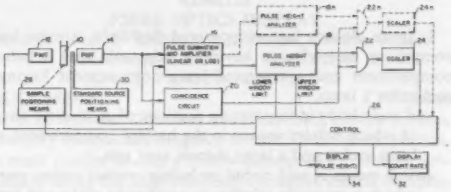
and control means for said film support adapted to be actuated from outside the chamber to move said support from a first position near the end of said rod outside the chamber and a second position opposite said emitter.

4,060,728

METHOD OF MEASURING THE DISINTEGRATION RATE OF BETA-EMITTING RADIONUCLIDE IN A LIQUID SAMPLE

Donald L. Horrocks, Placentia, Calif., assignor to Beckman Instruments, Inc., Fullerton, Calif.

Filed June 14, 1976, Ser. No. 696,003
Int. Cl.² G01T *1/00*
U.S. Cl. 250—328 **8 Claims**



1. A method of measuring the disintegration rate (DPM) of a beta-emitting radionuclide in a liquid sample using a scintillation counting system, comprising the steps of:

a. exposing the sample to radiation from a standard source and generating a pulse height distribution spectrum for the sample in the presence of the standard source,

b. detecting a unique point on the spectrum and measuring the corresponding pulse height value (PH_1),

c. counting pulses produced by the radionuclide in the sample (CPM_1) in a window bounded on one side by a zero

pulse height threshold detection limit for the counting system and bounded on the other side by a limit the value of which at least includes all the pulses produced by the radionuclide in the sample,

d. developing a quenched version of the sample,

e. exposing the quenched sample to radiation from the standard source and generating a pulse height distribution spectrum for the quenched sample in the presence of the standard source,

f. detecting the unique point on the latter spectrum and measuring the corresponding pulse height value (PH_2),

g. counting pulses produced only by the radionuclide in the quenched sample (CPM_2) in said window,

h. developing normalized values (R_1, R_2) for the measured pulse heights (PH_1, PH_2), and

i. correlating the normalized values (R_1, R_2) with corresponding pulse counts (CPM_1, CPM_2) to determine the value of the pulse count (CPM_0) for a normalized pulse height value of zero (R_0).

4,060,729

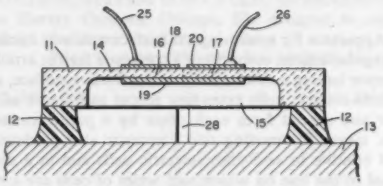
PYROELECTRIC DETECTOR WITH DECREASED SUSCEPTIBILITY TO VIBRATIONAL NOISE

Norman E. Byer, Columbia; Stanley E. Stokowski, Ellicott City, and John D. Venables, Baltimore, all of Md., assignors to Martin Marietta Corporation, Bethesda, Md.

Filed Dec. 10, 1976, Ser. No. 749,256

Int. Cl.² G01T 1/16

U.S. Cl. 250—338 **18 Claims**



1. A radiation detector comprising:

an integral wafer of pyroelectric material, said wafer comprising a relatively thin central region of substantially uniform thickness surrounded by a supporting rim having a thickness many times greater than said central region:

electrodes deposited on both surfaces of said central region defining between them at least one active detecting region;

external electrical connections to said electrodes being located on said rim on extensions of said electrodes beyond said active detecting region or regions; and

supporting means for said wafer attached only to said rim.

4,060,730

SCINTILLATION CAMERA FOR ESTABLISHING THE COORDINATES OF A RADIATION STIMULI PRODUCED BY A RADIATION FIELD

Jacob Zioni; Yitzhak Klein, and Dan Inbar, all of Haifa, Israel, assignors to Elscint, Ltd., Haifa, Israel

Continuation-in-part of Ser. No. 395,149, Sept. 7, 1973, abandoned. This application Sept. 6, 1974, Ser. No. 503,767

Int. Cl.² G01T 1/20, 1/164

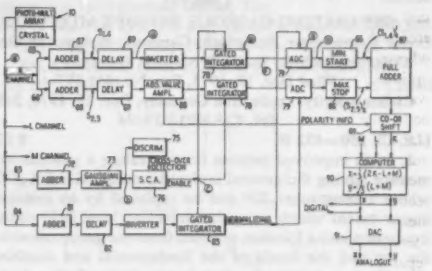
U.S. Cl. 250—369 **33 Claims**

1. A scintillation camera comprising:

a. a planar, unitary scintillating crystal responsive to radiation stimuli for producing light events at spatial locations corresponding to the spatial locations of the interactions of the stimuli with the crystal;

b. a plurality of photomultipliers positioned with their optical axes perpendicular to the plane of the crystal and having photocathodes for receiving light from the crystal, each photomultiplier producing an output in response to a light event in the crystal; and

c. computing circuitry coupled to said photomultipliers for computing the projection of a light event in the crystal on



a reference axis including means for forming an analytical function of the outputs of only those photomultipliers that are close to the light event in the crystal without attenuating such outputs.

4,060,731

DENTAL X-RAY APPARATUS

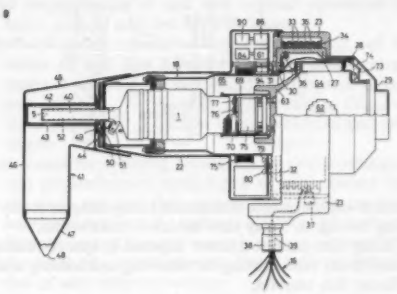
Walter Rissi, Lanzenhausern, Switzerland, assignor to Gesellschaft fur Elektronische Rohren Comet Bern, Bern, Switzerland

Filed Oct. 4, 1976, Ser. No. 729,514

Claims priority, application Switzerland, Oct. 6, 1975, 12956/75

Int. Cl.² H05G 1/10

U.S. Cl. 250—402 **6 Claims**



1. In apparatus for obtaining extra- and/or intra-oral dental X-ray photographs, of the type wherein high-voltage transformer and part of an X-ray tube are disposed in an inner casing contained within an outer housing, from an end face of which there projects an anode tube of said X-ray tube containing an anticathode and surrounded by an X-ray-permeable protective sleeve, the improvement comprising:

a plane anticathode target surface disposed within said anode tube and inclined with respect to the cathode-ray axis of said X-ray tube,

regulating means dependent upon the operating state of said apparatus for varying the cathode-ray current and/or the size of the focal spot,

an adapter designed to be fitted over said protective sleeve and secured to said end face of said outer housing for obtaining said intra-oral X-ray photographs,

a change-over switch disposed within said outer housing near said end face thereof and actuatable by said adapter for influencing said regulating means, and

an X-ray-proof jacket forming part of said adapter and designed to fit over said protective sleeve coaxially therewith.

4,060,732

SEPARATING GASEOUS ISOTOPE MIXTURES

Dieter Rosenberger, Sauerlach, Germany, assignor to Siemens Aktiengesellschaft, Berlin & Munich, Germany

Filed Dec. 18, 1975, Ser. No. 641,897
Claims priority, application Germany, Dec. 18, 1974, 2459989
Int. Cl.[2] H01J *39/34*
U.S. Cl. 250—432 R 5 Claims

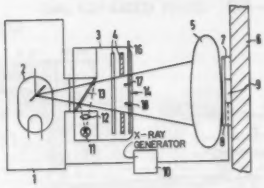
1. In an improved process for separating a gaseous isotope mixture having the general molecular composition $X_{a1}^{(1)}X_{a2}^{(2)}$ where a constituent $X^{(k)}$ can be replaced by an isotope, the improvement which comprises injecting laser light excitation irradiation into a location selected from the group consisting of the top and the bands of the fundamental and combination vibrations, and the vibration band edges of the electronic transitions associated with the isotopes comprising said mixture, said excitation irradiation being supplied by a laser source selected from the group consisting of a tunable laser and a pumping laser followed by a secondary tunable laser.

4,060,733

X-RAY DIAGNOSTIC APPARATUS WITH AN AUTOMATIC EXPOSURE TIMER

Kurt Franke, Erlangen, Germany, assignor to Siemens Aktiengesellschaft, 03, Berlin & Munich, Germany

Filed Oct. 16, 1975, Ser. No. 623,071
Claims priority, application Germany, Oct. 18, 1974, 2449708
Int. Cl.[2] G01N *23/02*
U.S. Cl. 250—491 4 Claims



1. An X-ray diagnostic installation comprising an X-ray tube housing having an X-ray tube mounted therewithin,

an X-ray film cassette drawer disposed in spaced relation to said X-ray tube housing for receiving and holding a planar X-ray film cassette,

a diaphragm housing disposed between said X-ray tube housing and said film cassette drawer and containing a primary X-ray focusing diaphragm and a light visor for illuminating a region of the body of a patient overlying said cassette drawer,

an X-ray generator comprising an automatic X-ray exposure timer having a measuring probe adjustably positionable within said cassette drawer in parallel relation to the plane of the X-ray film cassette received therewithin,

means operatively interconnecting said X-ray tube and said X-ray generator,

said X-ray tube housing, said cassette drawer and said diaphragm housing being arranged in aligned relation with one another,

shadow producing means adjustably positionable on said diaphragm housing in operative association with said light visor for producing an optically visual measuring area of selectively adjustable size and location on the body of the patient overlying said cassette drawer,

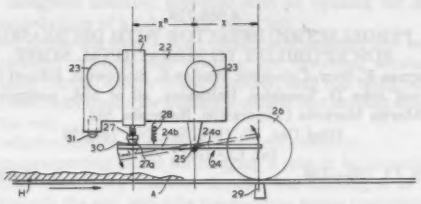
first position determining means on said diaphragm housing for determining the position of said shadow producing means relative to said diaphragm housing, and second position determining means on said cassette drawer and on said measuring probe corresponding to said first position determining means for determining the position of said measuring probe relative to said cassette drawer and for positioning said measuring probe in alignment with the measuring area produced by said shadow producing means.

4,060,734

APPARATUS FOR MEASURING IRREGULAR AREAS AND THICKNESSES

Leslie Joseph Tilley, Edinburgh, and Bernard Dugdale, Roslin, both of Scotland, assignors to Forth Instruments Limited, Midlothian, Scotland

Filed Mar. 18, 1976, Ser. No. 667,934
Claims priority, application United Kingdom, Mar. 25, 1975, 12343/75
Int. Cl.[2] G01N *21/30*
U.S. Cl. 250—560 10 Claims



1. Apparatus for measuring the surface area and thickness of an irregular article, comprising a conveyor for the article, said conveyor having a substantially non-reflective surface, a series of photo-electric cells extending across and above said conveyor and spaced from each other by a predetermined distance, means for moving said conveyor at a predetermined speed relative to said photo-electric cells and in a direction normal to the line on which said series of cells are arranged, light means for illuminating an article on the conveyor from above and by reflection from the article engerizing as the article is moved under the series of photo-electric cells such of said cells as register with the article, means for sampling the output from said cells at predetermined intervals of time, electronic means for computing from the corresponding increments of movement of the article between successive samplings and the corresponding sum of the distances between photo-electric cells energized the area of the article, and means for measuring variations in the thickness of the article comprising at least one mechanical to electrical transducer positioned so as to bear against the article and be adjusted by the varying thickness thereof, point detection means for detecting a predetermined position relative to the leading edge of the pelt and measurement indicating means connected to said transducer responsive to the electrical output therefrom and to the point detection means and arranged to as to indicate the thickness at the predetermined position.

4,060,735

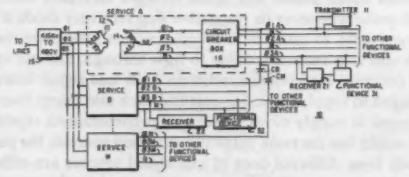
CONTROL SYSTEM EMPLOYING A PROGRAMMABLE MULTIPLE CHANNEL CONTROLLER FOR TRANSMITTING CONTROL SIGNALS OVER ELECTRICAL POWER LINES

Gregory A. Pascucci, Milwaukee; Ramesh Krishnaiyer, Hales Corners, and Donald Floyd Pridemore, Milwaukee, all of Wis., assignors to Johnson Controls, Inc., Milwaukee, Wis.

Filed July 12, 1976, Ser. No. 704,536
Int. Cl.[2] H02J *3/02*
U.S. Cl. 307—3 40 Claims

1. In a control system wherein functional devices are controlled in response to control signals transmitted over an elec-

trical power distribution network of a building complex including power lines which conduct cyclical AC power signals, a control arrangement comprising transmitter means including timing means coupled to one of said power lines and responsive to a plurality of cycles of said power signals to define a like plurality of data channels which comprise a data frame, and signal means responsive to said timing means for providing control signals at a predetermined frequency which are coupled to said power line during selected ones of a plurality of said data channels for transmission over said power distribution network, and a plurality of receiver means each individually associated with a different one of said functional devices, each of said receiver means including input means coupled to one of said power lines for detecting said control signals, and enabling means for enabling the associated receiver means to respond to control signals in at least one of said data channels for controlling the associated functional device.

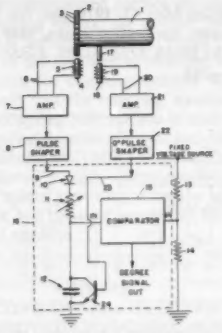


4,060,736

CONTROL SYSTEM FOR CYCLIC OPERATIONS

Robert Harvey Connors, Chicago, Ill., assignor to Triangle Package Machinery Co., Chicago, Ill.

Filed Mar. 11, 1976, Ser. No. 666,018
Int. Cl.[2] H01H *7/00*
U.S. Cl. 307—141 **25 Claims**



19. The method of controlling the timing of the occurrences of operations within a cycle of operations and of establishing the beginning of a cycle, comprising the steps of,

a. detecting a preselected repeatable point of reference in a cycle,

b. establishing first and second predetermined charge levels associated with each operation to be performed,

c. changing the charge level from said first predetermined charge level to said second predetermined charge level at a rate of change proportional to the speed of each cycle each time the associated operation is to be performed,

d. emitting a control signal for an operation to be controlled thereby when said second predetermined charge level is reached, and

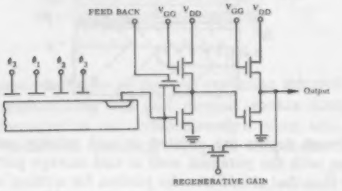
e. thereafter changing the charge level back to said first predetermined charge level after the emission of said control signal, whereby, at the time said point of reference is detected, said first charge level will have been reached.

4,060,737

CHARGE COUPLED DEVICE SHIFT REGISTERS HAVING AN IMPROVED REGENERATIVE CHARGE DETECTOR

William Milton Gosney, Richardson, Tex., assignor to Texas Instruments Incorporated, Dallas, Tex.

Division of Ser. No. 499,717, Aug. 22, 1974, Pat. No. 3,979,603. This application May 19, 1976, Ser. No. 687,726
Int. Cl.[2] H03K *5/18, 3/286, 3/353;* **H01L** *29/78*
U.S. Cl. 307—221 D **6 Claims**



1. In a charge coupled device shift register including a plurality of stages, each including a plurality of transfer electrodes, means for applying multiphase clock signals to said electrodes to shift data signals along said shift register, data output means for said shift register adjacent a selected transfer electrode of one of said stages, said selected transfer electrode connected for application of a predetermined phase clock signal thereto; and regenerative charge detector means consisting of:

first and second non-clocked inverter stages connected between respective voltage supply lines, means cross coupling input nodes and output nodes of said inverter stages, one of said cross coupling means including gating means connected for operation by said predetermined phase clock signal;

said output means of said shift register connected to the input node of said first inverter stage;

feedback means connected between the input and output nodes of said first inverter stage for precharging said nodes of said first inverter stage to a reference voltage set by a value $V_{out} = V_{in}$ on an output voltage (V_{out}) versus input voltage (V_{in}) transfer characteristic of said inverter stages;

and means for applying subsequent to said precharge step, said predetermined phase signal to said selected transfer electrode and said shift register for causing regenerative imbalance between the voltages at the output nodes of said first and second inverter stages in a sense corresponding to the level of said transferred data signal compared with that of said reference voltage.

4,060,738

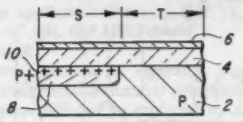
CHARGE COUPLED DEVICE RANDOM ACCESS MEMORY

Al F. Tasch, Jr, Richardson; Robert Charles Frye, Plano; Horng-Sen Fu, and Robert W. Brodersen, both of Dallas, all of Tex., assignors to Texas Instruments Incorporated, Dallas, Tex.

Continuation of Ser. No. 554,889, March 3, 1976. This application Nov. 8, 1976, Ser. No. 739,758
Int. Cl.[2] H03K *5/00;* **H01L** *29/78, 29/04;* **G11C** *11/24*
U.S. Cl. 307—238 **20 Claims**

1. A memory cell for a semiconductor memory device, comprising a gate conductor-insulator-semiconductor region, the semiconductor of said region having one conductivity type and including a storage portion and an adjacent transfer portion with at least part of the gate conductor of said region overlying and electrically coupled to both said storage and transfer portions for receiving clock pulses to create potential wells at said storage and transfer portions, the semiconductor of said region further including a sense portion adjacent said

transfer portion for receiving signal charge corresponding to logic 1 and logic 0 signal levels for writing into and read-out from said storage portion, and for receiving signal charge corresponding to logic 1 and logic 0 signal levels read-out from said storage portion, the conductor-insulator-semiconductor region at said storage and transfer portions having differing threshold voltage and semiconductor surface potential-gate voltage characteristics such that responsive to a selected first clock pulse level applied to said gate conductor, potential wells



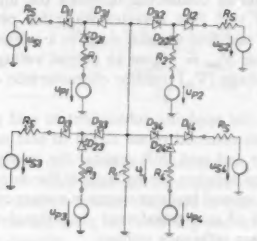
of different depths are created at said storage and transfer portions with the potential well at said storage portion being deeper than that at said transfer portion for writing logic signal charge inputs from said sense portion into said storage portion, and responsive to a second selected clock pulse level potential wells having a lesser difference in depth are created at said storage and transfer portions with the potential well at said transfer portion being deeper than that at said storage portion for reading logic signal charge from said storage portion into said sense portion.

4,060,739

CIRCUIT ARRANGEMENT FOR AMPLIFYING PULSED SIGNALS

Peter Russer, and Johann Gruber, both of Ulm (Danube), Germany, assignors to Licentia Patent-Verwaltungs-G.m.b.H., Frankfurt am Main, Germany

Filed Dec. 12, 1975, Ser. No. 640,152
Claims priority, application Germany, Dec. 17, 1974, 2459496
Int. Cl.[2] H03K 3/33
U.S. Cl. 307—319 **4 Claims**



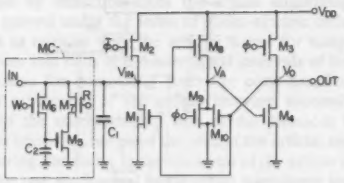
1. A circuit arrangement for amplifying and multiplexing a plurality of electrical pulsed signals comprising: a plurality of step recovery diodes; a plurality of signal sources, one for each said diode, each providing a respective sequence of pulsed signals; a plurality of first switching diodes each connected between a respective step recovery diode and a respective signal source and poled to conduct current in the forward direction of its respective step recovery diode for conducting pulsed signals from its respective signal source to its respective step recovery diode in a manner to cause each such pulsed signal to charge said respective step recovery diode; a plurality of pump sources each producing a train of clock pulses and each connected to a respective one of said step recovery diodes for biasing its respective step recovery diode and said first switching diode connected thereto in the forward direction during the intervals between clock pulses and for causing each such clock pulse to produce a current flow in the reverse direction of its respective step recovery diode whenever said step recovery diode is in a charged state, each current flow produced by a clock pulse acting to discharge said respective step recovery diode; a plurality of second switching diodes each having one terminal connected to the point of connection between a respective step recovery diode and first switching diode, with the other terminal of all of said second switching diodes being connected to a common output point, and a common load resistor connected between said common output point and ground, each said second switching diode being poled to be biased in its reverse direction during the intervals between clock pulses and in its forward direction during a clock pulse whenever its respective step recovery diode is in a charged state, to cause each reverse current flow occurring in each said step recovery diode to flow through, and act upon, said common load resistor, wherein each said signal source is arranged to supply pulsed signals and each said pump source is arranged to supply clock pulses at a predetermined repetition rate which has the same value for all of said sources, the pulsed signals from different ones of said signal sources are offset in time from one another by an amount equal to the repetition rate period divided by the total number of said step recovery diodes, and the signal pulses produced by each said signal source occur in the intervals between the clock pulses produced by that pump source connected to the same step recovery diode, whereby said load resistor provides an output signal constituting an amplified and time multiplexed representation of all of said pulsed signals.

4,060,740

SENSING AMPLIFIER FOR CAPACITIVE MISFET MEMORY

Kotaro Nishimura, Fuchu, Japan, assignor to Hitachi, Ltd., Japan

Filed May 12, 1976, Ser. No. 685,925
Claims priority, application Japan, May 28, 1975, 50-62900
Int. Cl.[2] H03K 5/18, 3/286, 3/353; G11C 11/40
U.S. Cl. 307—362 **14 Claims**



1. A sensing amplifier for sensing an output signal from a capacitive MISFET memory cell containing a memory capacitance, comprising:

an input terminal for receiving the output signal from said memory cell;

an output terminal;

first and second sensing MISFETs, the sources of said first and second sensing MISFETs being connected to a first reference potential, the drain of said first sensing MISFET being connected to the gate of said second sensing MISFET and to said output terminal, the drain of said second sensing MISFET being connected to said input terminal; and

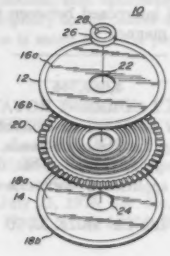
a signal level shifting circuit connected to said input terminal at an input side thereof and to the gate of said first sensing MISFET at an output side thereof for shifting the level of the output signal from said memory cell, the level-shifted output signal being applied to the gate of said first sensing MISFET.

4,060,741

HIGH POWER PIEZOELECTRIC BENDER

Hugo Willy Schafft, Des Plaines, Ill., assignor to Motorola, Inc., Schaumburg, Ill.

Filed Dec. 29, 1975, Ser. No. 644,665
Int. Cl.² H01L 41/04
U.S. Cl. 310—332 11 Claims



1. A bimorph bender for driving a mechanical member comprising:

a pair of disc members, each disc member formed of a piezoelectric material and having first and second diametrically opposed surface portions, each disc further provided with a centrally located coupling hole defined by a disc coupling hole surface;

electrode members contiguous with a substantial portion of each disc member first and second surface portions;

a center vane member, provided with a centrally located coupling hole, for separating the discs in fixed spaced relationship and aligning the coupling holes to form a coupling cavity;

a coupling member comprised of an electrically insulating and mechanically stiff material, having a stiffness approximately equal to or greater than said piezoelectric material, and having a predetermined surface dimension for insertion in the coupling cavity, the coupler member further provided with a means adapted to rigidly affix the coupling member to the mechanical member; and

a means for affixing the coupling member within the coupling cavity such that the coupling member is stiffly attached to the coupling hole surface of each disc,

whereby the coupling member material and dimension maintains a high mechanical stress force across the bender surface to achieve a high electromechanical coupling factor thereof while providing a means adapted to mechanically affix and transmit movement of the bender to the mechanical member.

4,060,742

SUPERCONDUCTIVE DYNAMOELECTRIC MACHINE WITH IMPROVED CRYOGENIC SUPPORT ARRANGEMENT

Donald C. Litz, Monroeville, Pa., assignor to Westinghouse Electric Corporation, Pittsburgh, Pa.

Continuation of Ser. No. 398,023, Sept. 17, 1973, now Defensive Publication No. T934,001. This application Dec. 31, 1975, Ser. No. 645,588
Int. Cl.² H02K 9/00
U.S. Cl. 310—52 12 Claims

1. A superconducting dynamoelectric machine comprising:

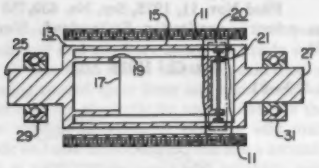
a generally cylindrical stator;

a generally cylindrical first rotor portion at ambient temperature concentric with said stator;

a generally cylindrical second rotor portion at cryogenic temperature concentric with said first rotor portion;

a generally cylindrical support ring associated with said second rotor portion, said support ring being constructed of a material having a first coefficient of thermal expansion; and

a plurality of generally radially extending support spokes interconnecting said first and second rotor portions, each of said spokes having one end connected to said first rotor portion and the other end connected to said support ring, said support spokes being constructed of a material having



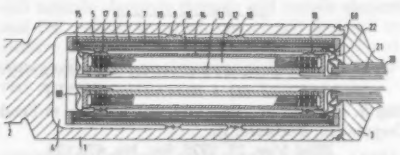
a second coefficient of thermal expansion selected so that said support ring and said support spokes contract an equal amount in the radial direction when said second rotor portion is cooled to cryogenic temperature.

4,060,743

SUPERCONDUCTIVE EXCITER WINDING FOR THE ROTOR OF A TURBOGENERATOR AND METHOD OF PRODUCTION

Erich Weghaupt, Mulheim (Ruhr), Germany, assignor to Kraftwerk Union Aktiengesellschaft, Mulheim (Ruhr), Germany

Filed June 2, 1975, Ser. No. 583,158
Claims priority, application Germany, Jan. 28, 1975, 2503428
Int. Cl.² H02K 9/10
U.S. Cl. 310—52 9 Claims



1. In a turbogenerator rotor having a hollow cylindrical body, the combination of winding support means disposed within the hollow cylindrical rotor body for supporting a superconductive winding, a plurality of intermediate cylinders comprising vibration damping and cold shielding cylinders disposed around said winding support means intermediate said winding support means and the cylindrical body of the rotor, said winding support means, being force-lockingly connected to the cylindrical rotor body through axially transposed articulating points on said intermediate cylinders yet being permitted resiliency thereat in radial direction, said winding support means comprising a support cylinder disposed within said intermediate cylinders and formed with axially extending slots uniformly distributed about the outer periphery thereof, said slots having respectively equal dimensions and having a content of respectively equal dimension and equal weight consisting of conductors formed at least partly of copper or superconductive material or both thereof, slot wedges covering said slots respectively at the outer peripheral surface of said support cylinder, and a bracing cylinder having a length equal to that of said support cylinder being coaxially disposed thereon in shrink fitting engagement therewith.

V964/5 N029 77 UMI

4,060,744

ROTARY ELECTRICAL MACHINE OR VERTICAL CONSTRUCTION

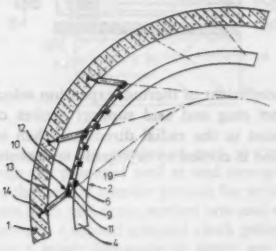
Mihailo Starčević, Mellingen, Switzerland, assignor to BBC Brown Boveri & Company Limited, Baden, Switzerland

Filed Nov. 11, 1975, Ser. No. 630,758

Claims priority, application Switzerland, Nov. 19, 1974, 15351/74

Int. Cl.² H02K 5/00

U.S. Cl. 310—91 **5 Claims**



1. An electrical machine of vertical construction, the stator and surrounding foundation of which form concentric radially spaced inner and outer rings respectively, a system of circumferentially extending and uniformly distributed spoke-like arms located intermediate said inner and outer rings, and means joining the opposite ends of said arms to said inner and outer rings, the respective axes of said arms forming identical acute angles with radial lines extending respectively from the common center of said inner and outer rings through corresponding joints which interconnect the outer ends of said arms with said outer ring, and said arms being inflexible over their whole effective length in the longitudinal direction corresponding to the applied load, all of said arms being inclined in the same sense so as to accommodate torsional stresses imposed upon said inner ring caused by thermally induced expansion thereof.

4,060,745

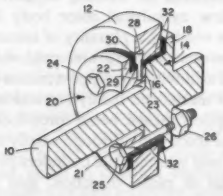
STRUCTURE FOR ATTACHING A PERMANENT MAGNET TO A ROTATING SHAFT

Phillip S. Linscott, Jr., Rockford, Ill., assignor to Sundstrand Corporation, Rockford, Ill.

Filed Mar. 25, 1976, Ser. No. 670,139

Int. Cl.² H02K 21/08

U.S. Cl. 310—156 **9 Claims**



1. A rotatable structure comprising:

a shaft;

an annular magnet;

a generally circular support portion integral with the shaft having an outer supporting surface with a diameter less than the inside diameter of the permanent magnet and additionally including a shoulder portion effective to restrain axial movement of the permanent magnet in a first axial direction;

a shouldered ring having a shoulder effective to restrain axial movement of the permanent magnet in a second axial direction;

means for securing said shouldered ring to said support portion;

at least one securing member engaged with the permanent magnet to prevent the rotation of the magnet with respect to the shaft; and

a flexible material interposed between the said supporting surface and the magnet.

4,060,746

ELÉCTRIC DIRECT CURRENT ROTATING MACHINE

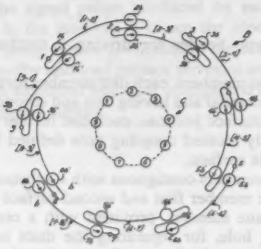
Marc Heyraud, Les Geneveye-sur-Coffrane, Switzerland, assignor to Portescap, La Chaux-de-Fonds, Switzerland

Filed Sept. 5, 1975, Ser. No. 610,861

Claims priority, application Switzerland, July 11, 1975, 9076/75

Int. Cl.² H02K 23/00

U.S. Cl. 310—177 **11 Claims**



1. In an electric rotating machine having a stationary magnetic circuit and a rotor bearing at least one winding, said winding comprising a plurality of sections connected in series, each said section being formed of at least two series-connected coil elements; means for connecting the opposite ends of a section to adjacent segments of a commutator associated with said winding; the winding sections being arranged on the rotor such that at least one of said coil elements of one section and at least one of said coil elements of a different section are rotated to be disposed concurrently in the commutation zone so that currents flow through the respective coil elements of said different sections in opposite directions.

4,060,747

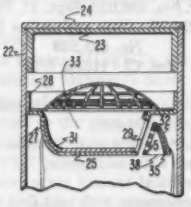
PHOTOTUBE HAVING DOMED MESH WITH NON-UNIFORM APERTURES

Richard Dale Faulkner, Lancaster, Pa., assignor to RCA Corporation, New York, N.Y.

Filed Feb. 4, 1976, Ser. No. 655,165

Int. Cl.² H01J 39/00, 39/04

U.S. Cl. 313—95 **9 Claims**



1. An electron discharge tube comprising an evacuated tube; a photocathode in said tube; a dynode having a covered input opening and an output opening in said tube; a dome-shaped radially symmetric mesh covering said input opening, said mesh having a plurality of spaced first elongated elements of

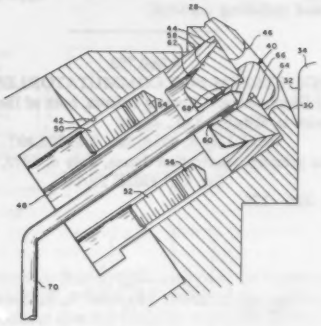
electrically conducting material, and a plurality of spaced second elongated elements of electrically conducting material, said first elements and said second elements intersecting to form non-uniform apertures; said mesh further comprising a center and a periphery; said first elements being substantially radial elements; and said second elements being substantially circumferential elements; said apertures being progressively larger from the periphery to the center of said mesh whereby said central portion is more electron permeable than the peripheral portion.

4,060,748

SURFACE BREAKDOWN IGNITER FOR MERCURY ARC DEVICES

John R. Bayless, Malibu, Calif., assignor to Hughes Aircraft Company, Culver City, Calif.

Filed July 23, 1976, Ser. No. 707,976
Int. Cl.² H01J *13/06, 13/34;* H01T *13/52*
U.S. Cl. 313—171 **8 Claims**



1. An igniter for a liquid metal plasma valve having an anode, a cathode and a condenser in an envelope so that a low pressure plasma arc discharge can operate between the cathode and anode and the atoms can be condensed out on the condenser;

said cathode having a pool-keeping wall for defining a liquid metal pool on which an arc runs to form the plasma discharge, an opening in said pool-keeping wall, said opening being defined by an igniter cathode wall which is continuous with said pool-keeping wall;

a block of semiconductor material having a front surface positioned in said opening with said front surface in engagement with said igniter cathode wall and below said pool-keeping wall; and

an igniter anode engaging said surface of said block of semiconductor material, said igniter anode being spaced from said igniter cathode so that upon application of voltage between said igniter anode and said igniter cathode a surface breakdown arc occurs across the front surface of said semiconductor material for igniting a plasma arc between said anode and said cathode of said liquid metal plasma valve.

4,060,749

FLAT DISCHARGE DISPLAY PANEL HAVING POSITIVE COLUMN DISCHARGE AND AUXILIARY ANODE ELECTRODES

Shinichi Shinada, Kokubunji, and Shigeo Mikoshiba, Tokyo, both of Japan, assignors to Hitachi, Ltd., Japan

Filed Sept. 15, 1976, Ser. No. 723,608
Claims priority, application Japan, Sept. 17, 1975, 50-111625; May 24, 1976, 51-59120
Int. Cl.² H01J *61/30, 61/42, 61/54, 61/56*
U.S. Cl. 313—484 **14 Claims**

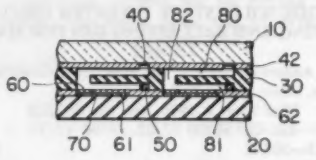
1. In a flat discharge display panel of the type having a plurality of gas discharge cells arrayed in a matrix form, an improvement wherein each cell comprises:

a main anode electrode, and means for supporting said main anode electrode;

an auxiliary anode, and means for supporting said auxiliary anode;

a cathode electrode interposed between said main anode electrode and said auxiliary anode electrode and perpendicular to said main anode electrode, said auxiliary electrode being spaced apart from said main anode electrode and said cathode electrode by such a distance that a first positive column is produced between said main anode electrode and said cathode electrode and a second positive column is produced between said auxiliary anode electrode and said cathode electrode in parallel with said first positive column;

first means defining a main discharge space between said main anode electrode and said cathode electrode,



said first positive column being produced in said main discharge space;

second means defining an auxiliary discharge space between said auxiliary anode electrode and said cathode electrode, said auxiliary discharge space being in communication with said main discharge space through a passage, said second positive column being produced in said auxiliary discharge space; and

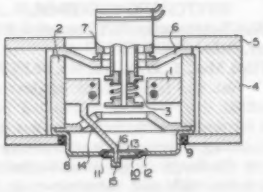
a resistor element connected to said cathode electrode, whereby when a DC voltage is applied between said anode electrode and said cathode electrode through said resistor element and between said auxiliary electrode and said cathode electrode through said resistor element and said DC voltage is varied, one of said first and second positive columns may be selectively produced and said first positive column thus produced may be used for display purposes.

4,060,750

COMPACT MAGNETRON WITH SMALL AXIAL LENGTH AND SLOT ANTENNA OUTPUT ATTACHED THERETO

Norio Tashiro, Yokohama, and Hirokazu Takahashi, Tokyo, both of Japan, assignors to Tokyo Shibaura Electric Co., Ltd., Kawasaki, Japan

Filed May 13, 1976, Ser. No. 685,995
Claims priority, application Japan, May 13, 1975, 50-55456
Int. Cl.² H01J *25/50*
U.S. Cl. 315—39.51 **23 Claims**



1. A vane-type magnetron comprising:

an anode having an anode cylinder and a plurality of vanes

extending from the inner surface of the anode cylinder toward the central axis of the anode cylinder to define resonance cavities within the anode cylinder,

a cathode disposed at the central axis of the anode cylinder,

magnetic means for applying a magnetic field to a space between the anode and the cathode,

a conductor member disposed at one end opening of the anode for electrical connection therewith,

a slot antenna comprising a bored slot in the conductor member for radiating microwaves generated in the resonance cavities,

a microwave-output conductor, one end of which is electrically connected to a vane and the other end of which is connected to a microwave-feeding point of the slot antenna, and

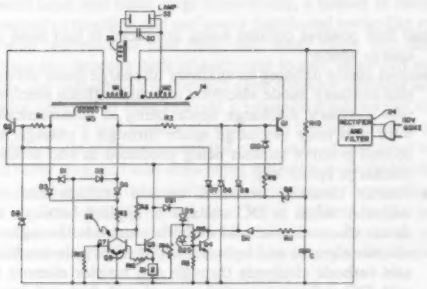
sealing means for maintaining the internal space of the anode hermetic.

4,060,751

DUAL MODE SOLID STATE INVERTER CIRCUIT FOR STARTING AND BALLASTING GAS DISCHARGE LAMPS

Thomas E. Anderson, Normal, Ill., assignor to General Electric Company, Schenectady, N.Y.

Filed Mar. 1, 1976, Ser. No. 662,523
Int. Cl.² H05B *37/02, 39/04, 41/36*
U.S. Cl. 315—209 R **14 Claims**



1. A circuit for starting and ballasting a gas discharge lamp comprising:

inverter means for producing an alternating current output between a first output terminal and a second output terminal, including means for commutating the polarity of the voltage of said output at such times as the instantaneous value of said alternating current output equals a reference current level;

a capacitor and inductor connected in series between said first output terminal and said second output terminal to form a resonant circuit; and

a gas discharge lamp connected in parallel with said capacitor.

4,060,752

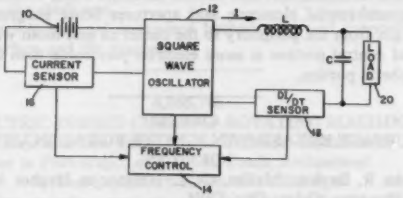
DISCHARGE LAMP AUXILIARY CIRCUIT WITH dI/dt SWITCHING CONTROL

Loren H. Walker, Schenectady, N.Y., assignor to General Electric Company, Schenectady, N.Y.

Filed Mar. 1, 1976, Ser. No. 662,524
Int. Cl.² H05B *41/26, 41/36*
U.S. Cl. 315—244 **14 Claims**

1. A circuit for starting and operating a gas discharge lamp of the type including a capacitance operatively connected in parallel with a discharge lamp, an inductance operatively connected in series with said capacitance to form a series resonant matching network, a variable frequency alternating current source connected to couple power into said matching network, and means for automatically adjusting the frequency of said source to excite a resonance of said network; wherein, as an improvement, said means for automatically adjusting the frequency comprises:

first circuit means connected to commutate the polarity of the voltage across said matching network at such times as



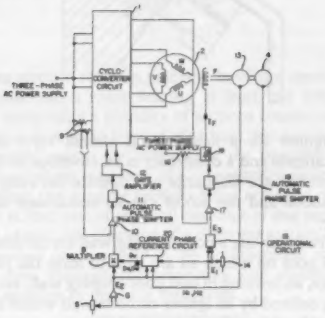
the time derivative of current flow in said inductance is substantially equal to zero, whereby the frequency of said source is automatically maintained at or near a resonance of said matching network.

4,060,753

CONTROL SYSTEM FOR COMMUTATORLESS MOTOR

Toshiaki Okuyama, and Yuzuru Kubota, both of Ibaraki, Japan, assignors to Hitachi, Ltd., Japan

Filed July 6, 1976, Ser. No. 702,897
Claims priority, application Japan, July 4, 1975, 50-81799
Int. Cl.² H02K *29/00*
U.S. Cl. 318—175 **8 Claims**



1. A control system for commutatorless motor comprising:

a. a synchronous motor having polyphase armature winding and a field winding,

b. a frequency converter for supplying AC current of variable frequency to the armature winding of said synchronous motor,

c. a position senser for detecting the position signal based on the rotational position of said synchronous motor,

d. a voltage setup means for producing a constant exciting current reference determined in magnitude of the terminal voltage of said synchronous motor,

e. first operational means for obtaining the magnitude of a nominal induced electromotive force of the vector sum of the armature reaction drop and the terminal voltage of said synchronous motor based on the signal proportional to the armature current and said constant exciting current reference produced from said voltage setup means,

f. second operational means for obtaining the phase difference between the nominal induced electromotive force obtained by said first operational means and the terminal voltage of said synchronous motor,

g. field control means for controlling the field current supplied to the field winding of said synchronous motor

responsive to the magnitude of the nominal induced electromotive force produced by said voltage setup means,

h. current phase reference means for producing a current phase reference leading the position signal of said position senser by the phase difference obtained by said second operational means, and

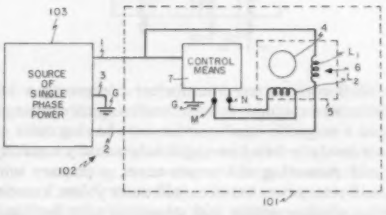
i. current control means for controlling the firing phase of said frequency converter based on the current phase reference and current reference.

4,060,754

ELECTRONIC MOTOR THAT INCLUDES AN ELECTRONIC WAVEFORM SYNTHESIZER AND THE SYNTHESIZER PER SE

James L. Kirtley, Jr., Brookline, and Richard H. Baker, Bedford, both of Mass., assignors to Massachusetts Institute of Technology, Cambridge, Mass.

Filed May 14, 1976, Ser. No. 686,355
Int. Cl.² H02K *17/08*
U.S. Cl. 318—218 **19 Claims**



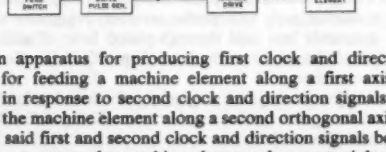
1. An electronic motor that comprises, in combination, a polyphase winding, at least one phase of the winding being adapted to connect directly across an incoming power line and at least one other phase of the winding being adapted to connect through control means to the power line, said control means comprising rectifier means, capacitance means, bilateral switch means, and logic means, the switch means serving to control the output of the rectifier means, and the logic means serving to control the bilateral switch means to establish a controllable phase shift between the power line voltage and the voltage applied to said at least one other phase.

4,060,755

MULTIPLE AXIS PATH CONTROL FOR A MANUALLY CONTROLLED MACHINE

Edward George Robillard, Cherry Valley, Mass., assignor to Cincinnati Milacron, Inc., Cincinnati, Ohio

Filed Apr. 5, 1976, Ser. No. 673,467
Int. Cl.² G05B *19/24*
U.S. Cl. 318—571 **9 Claims**



1. An apparatus for producing first clock and direction signals for feeding a machine element along a first axis of motion in response to second clock and direction signals for feeding the machine element along a second orthogonal axis of motion, said first and second clock and direction signals being operative to move the machine element along a straight line path having a slope defined by a feed angle formed between the path and the second axis of motion, the apparatus comprising:

a. means for storing an input signal representing the tangent of the feed angle;

b. means responsive to each pulse in the second clock signal for producing timing signals;

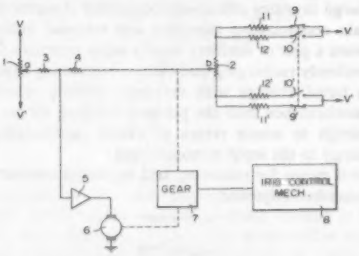
c. a counter means responsive to the input signal and the timing signals for accumulating in response to each pulse in the second clock signal a number equal to the tangent of the feed angle, and said counter means producing a carry pulse in response to the counter accumulations exceeding the counter modulus whereby the carry pulse represents a pulse in the first clock signal.

4,060,756

AUTOMATIC IRIS CONTROL MEANS FOR VARIABLE FOCAL LENGTH LENS SYSTEM

Naohei Watanabe, Kitamoto, and Tadaomi Inoue, Shobumachi, both of Japan, assignors to Fuji Photo Optical Co., Ltd., Omiya, Japan

Filed Oct. 16, 1974, Ser. No. 622,854
Claims priority, application Japan, Oct. 17, 1974, 49-118643
Int. Cl.² G05B *1/06*
U.S. Cl. 318—668 **4 Claims**



1. Means for controlling an iris of a variable focal length lens system comprising a servo-motor, a control potentiometer connected with the servo-motor for input of iris control signal, a position detecting potentiometer connected with the servo-motor to control the servo-motor by the balance made with reference to said control potentiometer, an iris control means connected with said servo-motor to control the diameter of an iris of the lens system, said iris control means being connected with said position detecting potentiometer so that the controlled position of the iris control means is detected by the detecting potentiometer, a plurality of change-over switches connected with said position detecting potentiometer, said switches being changed over in response to the change of the focal length of the lens system, and resistors having different resistance connected in series with said change-over switches, respectively.

4,060,757

INVERTERS HAVING A TRANSFORMER-COUPLED COMMUTATING CIRCUIT

William McMurray, Schenectady, N.Y., assignor to General Electric Co., Schenectady, N.Y.

Filed Sept. 17, 1976, Ser. No. 724,402
Int. Cl.² H02M *7/515*
U.S. Cl. 363—57 **28 Claims**

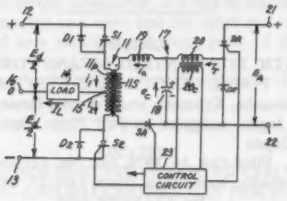
1. An inverter circuit comprising

at least one half-bridge inverter unit including first and second main thyristors connected in series between a pair of input unidirectional voltage supply terminals for alternate conduction of current selectively through the primary winding means of coupling transformer means to provide alternating-current output voltage at an output terminal, and feedback rectifier means in parallel with each main thyristor,

said coupling transformer means shaving inductively cou-

pled secondary winding means and functioning as a spanning reactor and to couple commutating current pulses to said main thyristors that are produced by a single commutating pulse generator,

said commutating pulse generator including a main commutating capacitor and at least one series-connected auxiliary thyristor for initiating discharge of said main commutating capacitor selectively through said secondary winding means, rebound circuit means comprising a rebound rectifier and rebound inductor in series across said main commutating capacitor to recover trapped energy, and a recharge thyristor effectively connected in series with said main commutating capacitor and rebound inductor between a pair of auxiliary supply input terminals for independently recharging said main commutating capacitor to an initial voltage with the same polarity which, upon transformation into the primary winding means, is high enough to assure return of excess commutating pulse energy to the input terminals, and



control means for rendering said thyristors conductive in a prescribed sequence.

4,060,758

POWER SWITCHING CIRCUIT HAVING A DARLINGTON CONNECTED TRANSISTOR PAIR

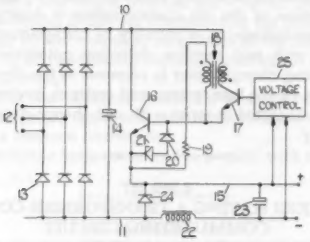
Owen Edgar Wright, Tring, England, assignor to Lucas Industries Limited, United Kingdom

Filed May 27, 1976, Ser. No. 690,618

Claims priority, application United Kingdom, June 4, 1975, 24066/75

Int. Cl.² G05F *1/56*

U.S. Cl. 323—17 **6 Claims**



1. A power switching circuit comprising a first supply conductor, a first output conductor, an output transistor having its collector connected to one conductor and its emitter connected to the other conductor, a drive transistor having its emitter connected to the base of the output transistor and its base connected to a control circuit and a transformer having one winding connecting the collector of the drive transistor to said one conductor and another winding connecting the emitter of the drive transistor to the emitter of the output transistor, the transformer being wound so that falling current in the collector of the drive transistor induces reverse bias current in the base-emitter junction of the output transistor.

4,060,759

TUBE-INSULATED SHELL-CORE CURRENT TRANSFORMER

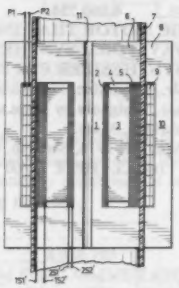
Kalevi Panu, Vaasa, Finland, assignor to Oy Stromberg AB, Vaasa, Finland

Filed Oct. 6, 1975, Ser. No. 620,114

Claims priority, application Finland, Oct. 18, 1974, 743148

Int. Cl.² H01F *40/06*

U.S. Cl. 323—60 **7 Claims**



1. A shell core current transformer comprising a tubular main insulator, a magnetic tubular measuring core having inner yokes and a magnetic tubular return core having outer yokes, said main insulator being arranged substantially coaxially between said measuring and return cores, a primary winding within said return core between said outer yokes, a secondary measuring winding within said measuring core between said inner yokes, a protecting core within said measuring core between said inner yokes and disposed coaxially with said main insulator, a protecting secondary winding within said measuring core between said inner yokes and between said protecting core and said main insulator, said secondary measuring winding being between said protecting core and said measuring core, said return core comprising a magnetic return circuit, whereby said primary winding serves both as a primary winding for said measuring core and as a primary winding for said protecting core.

4,060,760

EDDY CURRENT SENSOR FOR NON-DESTRUCTIVE TESTING THE QUALITY OF ELECTRICALLY CONDUCTIVE THROUGH-HOLE PLATING IN PRINTED CIRCUIT BOARDS

Viktor Igorevich Rogachev, Jurievsky pereulok, 22, korpus 2, kv. 55; Vasily Vasilievich Sukhorukov, 2 Vladimirskaya, 50, korpus 2, kv. 51, and Petr Nikolaevich Shkatov, Lefortovsky val, 7/6, korpus 4, kv. 69, all of Moscow, U.S.S.R.

Filed Feb. 6, 1976, Ser. No. 656,082

Claims priority, application U.S.S.R., Feb. 11, 1975, 2100851

Int. Cl.² G01R *33/12*

U.S. Cl. 324—2.9 **5 Claims**

1. An eddy current sensor for non-destructive testing of quality of electrically conductive through-hole plating in printed circuit boards comprising:

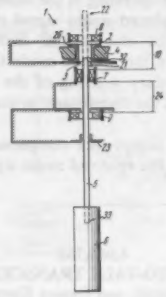
an elongated magnetic probe member having a first end and a second end, said probe member being movable and insertable into said through-plated hole of said printed circuit board when the latter is positioned in the path of movement;

means for moving said magnetic probe member for inserting said magnetic probe member into said hole of said printed circuit board;

a first winding coaxial with the probe's path of movement for inducing eddy currents in said electrically conductive plating of printed circuit boards holes when the latter are positioned adjacent thereto;

a second winding coaxial with the probe's path of movement and magnetically coupled with and rigidly fixed with respect to said first winding and positioned at a predetermined distance from said first winding for forming a gap to insert said tested printed circuit board;

a third winding coaxial with the probe's path of movement, connected in opposition to said second winding and magnetically coupled with the first winding, said third winding being rigidly fixed with respect to said first winding



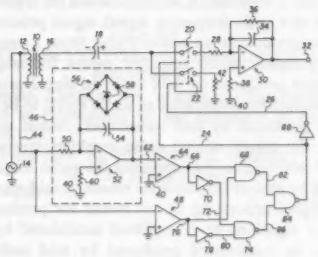
and said second winding and being positioned at a predetermined distance from said first winding on the other side in relation to said second winding, said first winding comprising an exciting winding, said second and third windings comprising measuring windings located on opposite sides of said first winding, said measuring windings being rigidly fixed relative to said exciting winding and said probe, when moved, being positioned axially within said windings and said through holes.

4,060,761

TUBULAR MAGNETIC FIELD SENSOR WITH MEANS TO RECTIFY THE SENSED SIGNAL

Melvin H. Rhodes, Cedar Rapids, Iowa, assignor to Rockwell International Corporation, El Segundo, Calif.

Filed Nov. 11, 1976, Ser. No. 740,915
Int. Cl.² G01R *33/04*
U.S. Cl. 324—253 **1 Claim**



1. Magnetic sensing apparatus comprising, in combination:

a tubular length of magnetic material;

a first winding wound from inside to outside the tubular material;

a second winding wound around the circumference of the tubular material;

excitation means for applying an excitation signal to one of said windings;

a volt second integrator means, connected to said excitation means;

logic means, connected to the excitation means and to said volt second integrator means, for providing control signals,

rectifier means, including control input means, connected to the other of said windings; and

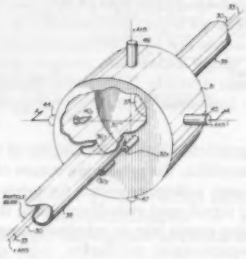
means connecting said control signals of said logic means to said control input means of said rectifier means for controlling the operation thereof to provide output sense signals indicative of magnetic field strength and direction in the vicinity of said magnetic material.

4,060,762

BIMODAL CAVITY RESONATOR BEAM POSITION MONITOR

Joseph McKeown, Deep River, Canada, assignor to Atomic Energy of Canada Limited, Ottawa, Canada

Filed Nov. 30, 1976, Ser. No. 746,158
Claims priority, application Canada, May 17, 1976, 252671
Int. Cl.² G01N *27/00*
U.S. Cl. 324—71 EB **5 Claims**



1. A charged particle beam position monitor comprising:

resonant cavity means capable of being excited in a first mode about the *x*-axis of the cavity means and in a second mode orthogonal to the first mode about the *y*-axis of the cavity means, said cavity means having beam holes in opposite surfaces of said cavity means, said beam holes being concentric with a *z*-axis through the intersection of the *x*-axis and *y*-axis, to allow the particle beam to pass through said cavity means such said first mode is excited in the cavity when the centroid of the beam is displaced along the *x*-axis and said second mode is excited in the cavity when the centroid of the beam is displaced along the *y*-axis;

tuning means mounted on said cavity means for tuning the orthogonal modes to the same frequency;

first detector means coupled to said first mode in said cavity means to provide a signal as a function of beam displacement along the *x*-axis; and

second detector means coupled to said second mode in said cavity means to provide a signal as a function of beam displacement along the *y*-axis.

4,060,763

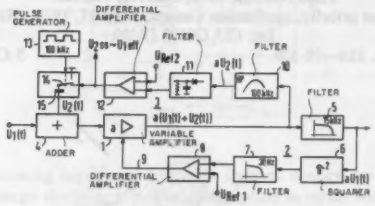
ARRANGEMENT FOR DETERMINING THE EFFECTIVE VALUE AND/OR THE POWER OF ELECTRICAL SIGNALS

Dieter Hassler, Erlangen, Germany, assignor to Siemens Aktiengesellschaft, Berlin & Munich, Germany

Filed Sept. 17, 1975, Ser. No. 614,333
Claims priority, application Germany, Sept. 18, 1974, 2444626
Int. Cl.² G01R *1/30, 17/06*
U.S. Cl. 324—123 R **6 Claims**

1. In an arrangement for determining at least one of the effective value, power intensity or cross power of one or more input electrical signals, such as Doppler signals received in ultrasonic-Doppler blood flow measurement, comprising at least one variable amplifier having a controllable amplification control circuit for regulating the degree of amplification of said variable amplifier, so as to produce a constant amplifier output power, said variable amplifier being connected to said

control circuit, the arrangement further comprising a measuring circuit connected to said variable amplifier for determining the adjusted degree of amplification of the variable amplifier at said constant amplifier output power, said measuring circuit comprising: means for producing an auxiliary measuring signal; means for supplying said auxiliary measuring signal together with an input electrical signal into said variable amplifier, and means connected with the output of said variable amplifier for deriving an amplified auxiliary measuring signal from the amplified electrical signals at the output of said variable amplifier; and regulating means in said measuring circuit for regulating the amplitude of the auxiliary measuring signal



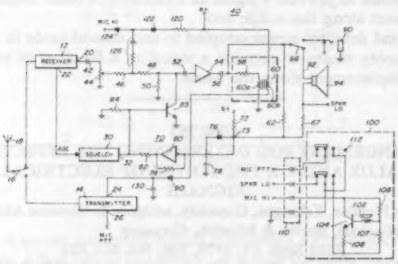
in an inverse proportionality to the degree of amplification of said variable amplifier, the producing means of the measuring circuit comprising: a chopper switch for generating said auxiliary measuring signal, said switch chopping the output signal of said regulating means into an amplitude-proportional direct current-free square-wave oscillation, said chopper switch being oscillated at a frequency outside the frequency band of the input electrical signal, and being substantially higher than the highest frequency occurring in the input electrical signal; and adding means having the higher-frequencied square-wave oscillation and lower-frequencied input electrical signal superimposed therein; and means for transmitting said superimposed signals to said variable amplifier.

4,060,764

TRANSCEIVER AUDIO SYSTEM

Charles William Bethards, and James Edward Andrews, both of Schaumburg, Ill., assignors to Motorola, Inc., Schaumburg, Ill.

Filed Mar. 25, 1976, Ser. No. 670,501
Int. Cl.² H04B 1/40
U.S. Cl. 325—18 **11 Claims**



1. A radio frequency (RF) transceiver comprising:

a receiver portion for receiving and processing RF signals and producing an audio signal;

a transmitter for producing a modulated RF signal, the transmitter having a modulating signal input for receiving a modulating signal and modulating an RF carrier therewith,

the transmitter including a modulating transformer having primary and secondary windings, the primary winding adapted to receive the modulating signal and the secondary adapted for coupling to the modulating signal input of the transmitter;

an audio compressor means for receiving and predeterminedly compressing audio signals; and

switching means for switching the transceiver to either the transmit or the receive modes, the switching means comprising coupling means, operable in the transmit mode, to couple the modulating signal from the audio compressor to the primary of the modulating transformer,

the switching means operating in the receive mode to couple the receiver produced audio signal through the audio compressor means and further including decoupling means operable in the receive mode to effectively open circuit the secondary winding of the modulating transformer, such that the transformer primary assumes a high impedance,

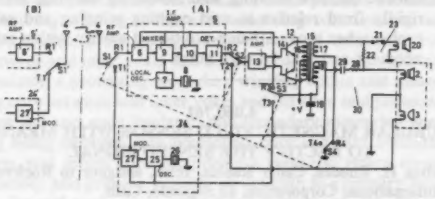
whereby the audio compressor compresses both the modulating signal and the received audio signal.

4,060,765

PRESS-TO-TALK TRANSCEIVER

Kenji Sakamoto, Takaichi, and Osamu Kawaai, Tokyo, both of Japan, assignors to Sanyo Electric Co., Ltd. and A & A Japan, Ltd., both of Noriguchy, Japan

Filed Aug. 18, 1976, Ser. No. 715,621
Claims priority, application Japan, Aug. 20, 1975, 50-101827
Int. Cl.² H04B 1/44
U.S. Cl. 325—21 **8 Claims**

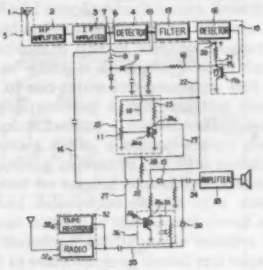


1. A press-to-talk transceiver comprising a handset having a receiver and a transmitter, antenna means for transmission and reception of a radio frequency signal, signal processing circuit means for producing an audio signal from a received radio frequency signal, audio amplifier means for amplifying the audio signal produced by said received signal processing circuit means and for amplifying an audio signal to be transmitted which is produced by said transmitter, output circuit means coupling the output of said audio amplifier means to said receiver of said handset for supplying the audio frequency signal amplified by said audio amplifier means to said receiver, transmission signal processing circuit means for producing a radio frequency signal to be transmitted modulated by the audio signal to be transmitted produced by said audio amplifier means, first press-to-talk switch means for selectively connecting said antenna means to said received signal processing circuit means during reception of a radio frequency signal and to said transmission signal processing circuit means during transmission of a radio frequency signal, second press-to-talk switch means for supplying the audio signal produced by said received signal processing circuit means to said audio amplifier means during reception of a radio frequency signal and for supplying the audio signal from said transmitter through to said audio amplifier means to said transmission signal processing circuit means during transmission, and side tone circuit means for supplying the audio signals to be transmitted as amplified by said audio amplifier means to said receiver of said handset.

4,060,766
AUTOMATIC SIGNAL SWITCHING APPARATUS FOR A COMBINED TRANSCEIVER AND RADIO OR TAPE RECORDER SET

Arai Kazuo, Kitamoto, Japan, assignor to Nissan Denshi Company Limited, Omiya, Japan

Filed May 7, 1976, Ser. No. 684,269
Int. Cl.² H04B 1/38
U.S. Cl. 325—22 **8 Claims**



1. An improved automatic switching system in a combination transceiver set and radio or tape recorder set which contains an output amplifier circuit, a first source of audio signals and a first audio output circuit, and means associated with the transceiver set for receiving audio signals and for reproducing said received audio signals including a second audio output circuit, comprising:

a first switching transistor in the first audio output circuit;

a first diode between the first audio output circuit and the output amplifier circuit;

a noise squelching circuit in the transceiver;

a second switching transistor in the noise squelching circuit;

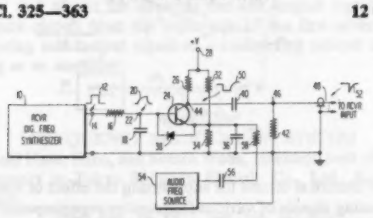
a second diode between the second audio output circuit and the output amplifier circuit; and

circuit means responsive to the second switching transistor upon the receipt of audio signals by the transceiver set, to cause the first switching transistor to bias the first diode to cut-off condition and to bias the second diode to conducting condition whereby to operatively connect only the second audio output circuit with the output amplifier circuit.

4,060,767
SELF TEST CIRCUIT FOR MULTICHANNEL RADIO RECEIVERS

Dieter Lohrmann, Lanham, Md., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Nov. 10, 1976, Ser. No. 740,568
Int. Cl.² H04B 17/00
U.S. Cl. 325—363 **12 Claims**



1. A self test circuit providing a simultaneously amplitude modulated and frequency modulated carrier signal for each frequency channel of a multichannel radio receiver having a substantially equal frequency separation between channels, comprising in combination:

circuit means providing a periodic signal having a predetermined sloping leading edge adapted to control the operating state of an electronic switch device and having a frequency equal to the frequency separation between channels;

an electronic switch device operable between first and second operating states coupled to said circuit means and being driven into one of said operating states by said periodic signal;

bias means coupled to said switch device for causing said switch device to switch to said one operating state at a selected point on said leading edge of said periodic signal intermediate the extremities thereof;

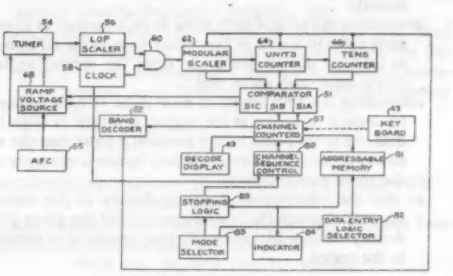
a modulation signal source coupled to said switch device for causing said switching to selectively vary about said selected point and thereby generate an intermediate output signal having a waveform including an abrupt changing leading edge which varies both in amplitude and phase; and

circuit means coupled to said switch device and being responsive to said intermediate output signal to pass the high frequency components of said waveform as an output signal to said receiver, said output signal having a harmonic frequency component at every channel which is both simultaneously amplitude modulated and frequency modulated.

4,060,768
MEMORY TUNING SYSTEM WITH DUAL SPEED PROGRAMMING

Akio Tanaka, Chicago, Ill., assignor to Zenith Radio Corporation, Glenview, Ill.

Filed Jan. 2, 1976, Ser. No. 646,116
Int. Cl.² H04B 1/16
U.S. Cl. 325—464 **4 Claims**



1. A programmable television tuning system including:

counting means sequentially generating channel numbers for tuning all channels;

means communicating to the viewer the tens and units digits of channel numbers generated by said counting means;

read/write memory means coupled to said counting means having a plurality of addressable locations for storage and recall of signals related to selected channel numbers;

mode selection means for establishing a program mode for storage of said signals and an operate mode for recall from said memory means of said signals to cause tuning to selected channels;

clock means selectively coupled to said counting means and producing timing pulses at regular intervals; and

counting speed control means, coupled between said clock means and said counting means and operating in said program mode for changing the counting speed of said counting means to reduce the time required to sequentially generate any channel number, said counting speed control means including (1) a plurality of flip/flops interconnected for continuous binary counting, responsive to said clock means and producing at least two distinct pre-

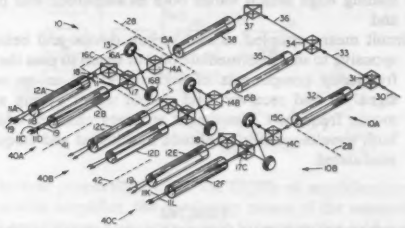
determined rates of counting pulses, and (2) a selector switch for selecting between said two distinct rates of counting pulses, said distinct rates being predetermined to permit a viewer to perceive counting by tens for the faster rate and counting by units for the slower rate.

4,060,769

DIRECTING RADIATION

Philip J. Mallozzi; Harold M. Epstein; David C. Applebaum, all of Columbus; William J. Gallagher, Worthington, and Bernerd E. Campbell, Columbus, all of Ohio, assignors to Battelle Memorial Institute, Columbus, Ohio

Filed Sept. 20, 1974, Ser. No. 507,877
Int. Cl.[2] H01S *3/00*; G02B *27/14*
U.S. Cl. 330—4.3 17 Claims



1. A method of directing radiation pulses to a region wherein either a pulse or a substance in the region is adversely affected by the presence of more than a given power density therein, comprising

providing in rapid succession a plurality of pulses each having a power density of not more than the given power density,

controlling the path of each pulse in such manner as to cause each pulse to arrive at the region at an angle differing by at least its divergence angle from the arrival angle of every other such pulse, and

controlling the path length of each pulse in such manner as to cause it to arrive at the region at a time enough later than the arrival time of the preceding pulse that the total power density in the region at any instant is not more than the given power density,

so that the effective total power density of the radiation directed through the region may exceed the given power density without adversely affecting any pulse or substance in the region.

4,060,770

DIFFERENTIAL AMPLIFIER

Otto Heinrich Schade, Jr., North Caldwell, N.J., assignor to RCA Corporation, New York, N.Y.

Division of Ser. No. 644,821, Dec. 29, 1975. This application Nov. 23, 1976, Ser. No. 744,408
Claims priority, application United Kingdom, Feb. 24, 1975, 07659/75
Int. Cl.[2] H03F *3/45*
U.S. Cl. 330—253 3 Claims

1. A differential amplifier circuit comprising:

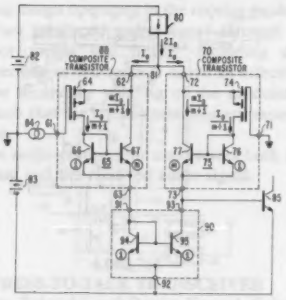
first and second terminals for receiving input signals;

third and fourth terminals for application of output signal to subsequent circuitry;

first and second field effect transistors of a first conductivity type, each having source and drain and gate electrodes, their respective gate electrodes being respectively connected to said first terminal and to said second terminal;

means for applying a bias current between said fourth terminal and an interconnection between the source electrodes of said first and said second field effect transistors;

first and second and third current mirror amplifiers, each of a type including a respective pair of bipolar mirroring transistors of a second conductivity type complementary to said first conductivity type and having respective input and output and common terminals, the input and output terminals of said first current mirror amplifier being connected to the drain and source electrodes respectively of said first field effect transistor, the input and output terminals of said second current mirror amplifier being connected to the drain and source electrodes respectively of



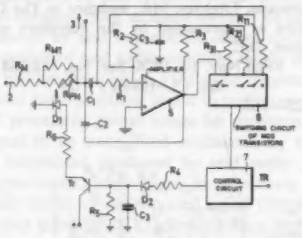
said second field effect transistor, the common terminal of said first current mirror amplifier being connected to the input terminal respectively of said third current mirror amplifier, the common terminal of said third current mirror amplifier being connected to said fourth terminal, and the output terminal of said third current mirror amplifier and the common terminal of said second current mirror amplifier being connected to said third terminal.

4,060,771

METHOD AND CIRCUIT ARRANGEMENT FOR CONDITIONING DIRECT CURRENT SIGNALS IN ELECTRIC MEASURAND TRANSMITTERS, PARTICULARLY ELECTROMECHANICAL PRECISION AND FINE BALANCES

Franz Josef Melcher, Ellierode, and Christian Oldendorf, Goettingen, both of Germany, assignors to Sartorius-Werke GmbH (und vorm. Gottinger Prazisions-Waagenfabrik GmbH), Goettingen, Germany

Filed Aug. 10, 1976, Ser. No. 713,285
Claims priority, application Germany, Aug. 22, 1975, 2537560
Int. Cl.[2] H03F *17/00*
U.S. Cl. 330—59 8 Claims



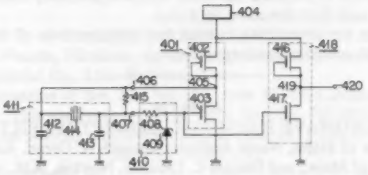
1. A electrical circuit for suppressing the effect of interfering alternating signals of various frequencies superimposed upon a direct current signal in measuring apparatus, such as in an electromechanical precision or fine balance, the circuit comprising a signal line for carrying the direct current signal and the interfering alternating signals; coupling-out means for capacitively coupling-out of interfering alternating signals of frequencies lower than a predetermined limit frequency from said signal line; amplifying and inverting means for amplifying

and inverting 180° in phase the coupled-out signals; coupling-back means for capacitively coupling-back into said signal line the amplified and inverted coupled-out signals; wherein said coupling-out means, said amplifying and inverting means, and said coupling-back means form an active low-pass filter and said coupling-out means and said coupling-back means each include a respective capacitor means directly connected to said signal line; variable resistive circuit means in circuit with said capacitor of said coupling-out means, said resistive circuit means, with respective said capacitor means of said coupling-out means and said coupling-back means, determining the time constant of said active low-pass filter; wherein said coupling-out means includes a pair of resistors in parallel with one another, one of which is a variable resistor for altering said time constant of said active low-pass filter, said variable resistor being a photoresistor; a light emitting diode positioned opposite said photoresistor; a circuit for supplying current to said light emitting diode; a control circuit coupled to said circuit for supplying current to said light emitting diode via a time delay circuit for turning on said light emitting diode after a predetermined delay upon receipt of a control signal; a switching circuit coupled to said control circuit and responsive to an output therefrom; said variable resistive circuit means being coupled to said switching circuit and responsive thereto for changing the resistance value of said resistive circuit means to provide a lower time constant for said active low-pass filter upon receipt of an output from said switching circuit.

4,060,772
OSCILLATOR

Hisashi Yamada, Oiso, and Yoshinori Horiko, Yokohama, both of Japan, assignors to Tokyo Shibaura Electric Co., Ltd., Tokyo, Japan

Filed Feb. 3, 1976, Ser. No. 654,852
Claims priority, application Japan, Feb. 6, 1975, 50-14907
Int. Cl.² H03B 5/36
U.S. Cl. 331—116 R **13 Claims**



1. An oscillator comprising a first inverter formed of insulated gate field effect transistors and acting as an oscillator; a feedback circuit formed of a passive circuit and designed to invert the phase of an output signal from the first inverter, amplify the output signal with a larger voltage gain than 1 and feed the output signal back to the input side of the first inverter; and means for drawing out the output signal of the feedback circuit from the input side of the first inverter and delivering said output signal to a succeeding second inverter acting as an amplifier.

4,060,773
FREQUENCY MODULATION SYSTEM

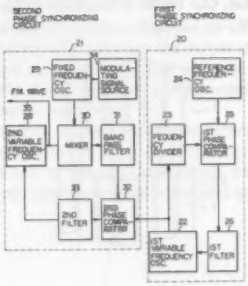
Masaaki Hata, Hino, and Sotaro Wada, Hachioji, both of Japan, assignors to Tokyo Shibaura Electric Co., Ltd., Kawasaki, Japan

Filed Jan. 24, 1977, Ser. No. 761,813
Claims priority, application Japan, Jan. 28, 1976, 51-7531
Int. Cl.² H03C 3/00
U.S. Cl. 332—19 **5 Claims**

1. A frequency modulation system comprising:

first means including a first variable frequency oscillator, a frequency divider for frequency dividing the output frequency of said first variable frequency oscillator, a reference frequency oscillator, and a first feedback circuit in which the output frequency of said reference frequency oscillator is compared in phase with that of said frequency divider and the result of the phase comparing is fed back to said first variable frequency oscillator through a first filter for controlling the output frequency of said first variable frequency oscillator;

second means including a second variable frequency oscillator, a fixed frequency oscillator, means in which the output frequencies of said second variable frequency oscillator and of said fixed frequency oscillator are mixed in a mixer thereby to obtain a difference frequency between



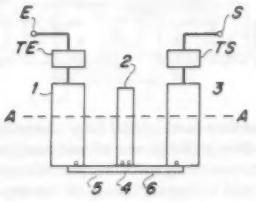
said both frequencies, and a second feedback circuit in which said difference frequency is compared in phase with the output frequency of said first variable frequency oscillator and the result of the phase comparing is fed back to said second variable frequency oscillator through a second filter for controlling the output frequency of said second variable frequency oscillator; and

third means in which the output frequency of said fixed frequency oscillator is frequency-modulated by the frequency of a modulating signal thereby to obtain a frequency-modulated wave from said second variable frequency oscillator.

4,060,774
ELECTROMECHANICAL BAND-PASS FILTER FOR HIGH FREQUENCIES

Herbert Ernyei, Paris, France, assignor to Societe Lignes Telegraphiques et Telephoniques, Paris, France

Filed June 14, 1976, Ser. No. 695,920
Int. Cl.² H03H 9/04, 9/26
U.S. Cl. 333—71 **4 Claims**



1. An electromechanical band pass filter comprising:

substantially cylindrical mechanical resonators operating in a longituinal mode arranged with their axes parallel and in the same plane;

wires operating in a bending mode coupling said resonators so that two adjacent resonators are coupled through a single quarter wave length wire connected at one of their terminal faces located in a same plane, and said resonators are divided into two sets, all the resonators of one set

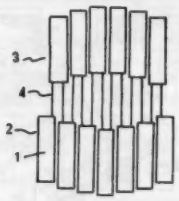
having one first terminal face in a first plane and all the resonators of the other set having a second terminal face in a second plane, one resonator belonging to both sets and the couplers for each set being a single wire.

4,060,775

ELECTROMECHANICAL BAND-PASS FILTERS

Philippe Marie Allemandou, Ablon, and Didier Marcel Beaudet, Saint-Maur-Des-Fosses, both of France, assignors to Societe Anonyme de Telecommunications, Paris, France

Filed July 21, 1976, Ser. No. 707,193
Claims priority, application France, Aug. 4, 1975, 75.24217
Int. Cl.[2] H03H *9/02, 9/26, 9/24*
U.S. Cl. 333—71 **3 Claims**



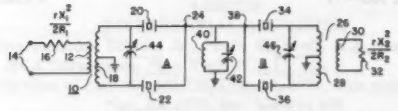
1. A band-pass electromechanical filter, comprising an input electromechanical transducer, an output electromechanical transducer and a mechanical filter disposed therebetween, said filter having p resonators and $(p-1)$ coupling pins, resonating all in the longitudinal mode, each coupling pin connecting two adjacent resonators, wherein the coupling pins have identical diameters and lengths varied according to their respective position within said mechanical filter, the length value being minimum at the end coupling pins and progressively increasing to a maximum at the half-way coupling pins.

4,060,776

INTERMEDIATE-BAND CRYSTAL FILTER WITH LOW-TRANSIENT RESPONSE

Herman J. Blinchikoff, Baltimore, Md., assignor to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed May 17, 1976, Ser. No. 687,138
Int. Cl.[2] H03H *7/04, 7/08*
U.S. Cl. 333—72 **4 Claims**



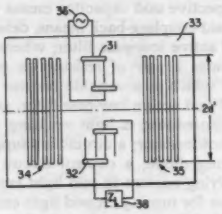
1. An intermediate-band crystal filter comprising at least one pair of lattice filter sections, one of said sections including an input transformer winding and a first pair of crystals connected to each other and to opposite ends of the input transformer winding, the other of said sections including an output transformer winding and a second pair of crystals connected to each other and to opposite ends of the output transformer winding, said sections being directly connected together at the junctions between the crystals of each pair of crystals, and said junctions being connected by a parallel-connected inductor and capacitor to the midpoints of said input and output transformer windings, each of said filter sections comprising a semi-lattice equivalent to a lattice network derived from a prototype low-pass ladder network, and said inductor and capacitor being common to both filter sections.

4,060,777

GUIDED ELASTIC SURFACE WAVE FILTER

Harry Frank Tiersten, Schenectady, N.Y., and Robert Chastain Smythe, Orlando, Fla., assignors to Piezo Technology Inc., Orlando, Fla.

Filed May 19, 1976, Ser. No. 687,901
Int. Cl.[2] H03H *9/02, 9/04, 9/26, 9/32*
U.S. Cl. 333—72 **25 Claims**



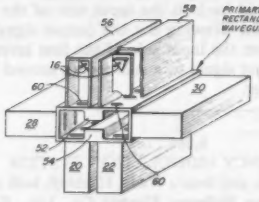
1. A surface wave resonator device comprising:
substrate means having at least a surface layer of piezoelectric material,
acoustic surface wave transducer means disposed on said piezoelectric surface of said substrate means operable in response to an input electrical signal to produce propagation of acoustic surface waves on said piezoelectric surface of said substrate means in a first direction,
means forming first and second arrays of elements on the piezoelectric surface of said substrate means on opposite sides of said acoustic surface wave transduoer means and being multiply reflective to the acoustic surface waves propagated by the transducer means to produce by energy trapping at least one region on the piezoelectric surface of said substrate means wherein a first acoustic standing wave resonance occurs which is generally in said first direction and a second acoustic standing wave resonance occurs in a second direction which is generally transverse to said first direction, and
means for controlling at least one characteristic of the second acoustic standing wave.

4,060,778

MICROWAVE HARMONIC ABSORPTION FILTER

Ibrahim El Hefni, North Andover; Kenneth A. Green, Andover, both of Mass., and Donald C. Cloutier, Newton, N.H., assignors to Microwave Research Corporation, North Andover, Mass.

Filed July 12, 1976, Ser. No. 704,211
Int. Cl.[2] H01P *1/20, 1/22, 1/16, 1/26*
U.S. Cl. 333—73 W **5 Claims**



1. A microwave absorption filter, comprising:
a. a primary, rectangular waveguide having first and second elongated wall members and two side wall members and having a ridge substantially centered on the inner surface of a first elongated wall member thereof;
b. secondary waveguides positioned on both sides of said ridge on the outer surface of said first elongated wall member; and,
c. apertures extending through said first elongated wall

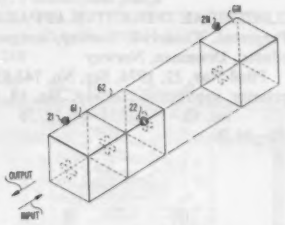
member and connecting the primary, ridged, rectangular waveguide to said secondary waveguides, said apertures being positioned off-center on said first wall member.

4,060,779

CANONICAL DUAL MODE FILTER

Ali Ezz Eldin Atia, Gaithersburg, and Albert Edward Williams, Bethesda, both of Md., assignors to Communications Satellite Corporation, Washington, D.C.

Filed Dec. 27, 1976, Ser. No. 754,804
Int. Cl.[2] H01P 1/16, 7/06, 1/20
U.S. Cl. 333—73 W 10 Claims



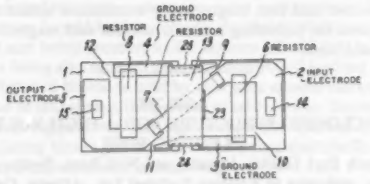
1. In a plural cavity waveguide filter comprising a plurality of cascaded waveguide cavities each resonating at its resonant frequency in a first and a second independent orthogonal mode, first coupling means in each of said cavities for intra cavity coupling of said first mode to said second mode, and second coupling means connecting successive ones of said cavities for inter cavity coupling like oriented modes in said successive cavities, the improvement wherein a reflective plate is provided in one end cavity and both input and output ports are provided in the other end cavity of said plurality of cascaded waveguide cavities.

4,060,780

SIGNAL ATTENUATOR

Kouji Nishida, Hirakata, Japan, assignor to Matsushita Electric Industrial Co., Ltd., Kadoma, Japan

Continuation of Ser. No. 588,159, June 17, 1975, abandoned.
This application Dec. 3, 1976, Ser. No. 747,385
Claims priority, application Japan, June 19, 1974, 49-70587
Int. Cl.[2] H01P 1/22
U.S. Cl. 333—81 A 5 Claims



1. A signal attenuator capable of withstanding the effects of lightning applied thereto, said attenuator comprising:

an insulator substrate having on one surface thereof an input electrode, an output electrode, and a pair of elongated ground electrodes, said input electrode and said output electrode being arranged symmetrically with respect to a point on said substrate, each of said input and output electrodes formed with a pair of intersecting arms angularly disposed with respect to one another, said ground electrodes being arranged symmetrically with respect to said point, the first of said ground electrodes being arranged with its opposite ends spaced respectively from a free end of one arm of said input electrode and from a free end of one arm of said output electrode to form a first lightning discharging gap between the first ground electrode and said input electrode and a second lightning discharging gap between the first ground electrode and said output electrode, the second of said ground electrodes being arranged with its opposite ends spaced respectively from a free end of the other arm of said input electrode and from a free end of the other arm of said output electrode to form a third lightning discharging gap between said second ground electrode and the input electrode and a fourth lightning discharging gap between said second ground electrode and the output electrode,

a first flat-shaped resistor disposed on said insulator substrate and connected between the input electrode and said second ground electrode,

a second flat-shaped resistor disposed on said insulator substrate and connected between the output electrode and the first ground electrode, said first and said second resistor being of the same resistance and arranged symmetrically with respect to said point,

a third flat-shaped resistor connected between the free end of the one arm of the input electrode and the free end of said other arm of the output electrode, and

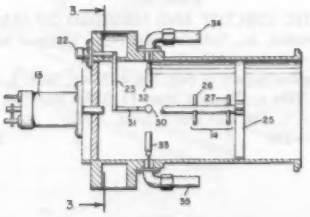
a shielding enclosure which encloses said attenuator.

4,060,781

WAVEGUIDE SWITCH

Thomas Hudspeth, Malibu, and Harmon H. Keeling, Los Angeles, both of Calif., assignors to Hughes Aircraft Company, Culver City, Calif.

Filed Sept. 16, 1976, Ser. No. 723,879
Int. Cl.[2] H01P 1/10, 1/16, 5/12, 1/17
U.S. Cl. 333—98 S 7 Claims



1. An improved microwave switch for generating circularly polarized waves in response to linear waves, comprising:

waveguide means being cylindrically shaped, having an aperture and having a closed end;

input probe means being radially mounted within said waveguide means and comprising first and second probes being disposed 180 degrees to each other for generating linear waves having a first polarity;

quarter-wave plate means rotatably disposed within said waveguide means between said input probe means and said aperture for generating selected right and left hand circular polarized waves in response to said linear waves; and

rotating means coupled to said quarter-wave plate means.

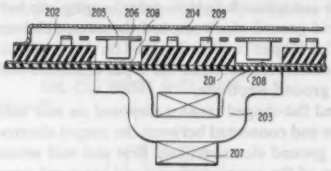
V 9 6 4 / 5 N 0 2 9 9 7 7 UMI

4,060,782

INTEGRATED TYPE SWITCHING DEVICE

Takashi Inagawa, and Sadayuki Mitsuhashi, both of Tokyo, Japan, assignors to Nippon Electric Company, Limited, Tokyo, Japan

Filed Feb. 19, 1976, Ser. No. 659,432
Claims priority, application Japan, Feb. 19, 1975, 50-19901
Int. Cl.² H01H *67/24*
U.S. Cl. 335—112 **9 Claims**



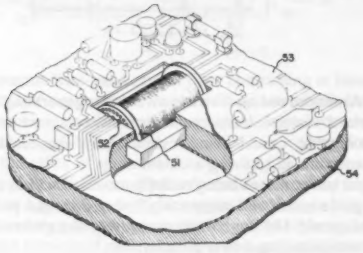
1. A switching device arranged in a matrix array comprising:
a first ceramic plate having a fixed contacts pattern of metalized layer arranged on one surface thereof;
second ceramic plate formed with through apertures in positions corresponding to said respective fixed contacts arranged on said first ceramic plate, said first and second ceramic plates being laid on each other in closely adhering relation to form an integral base plate for the switching device;
conductor means sandwiched between said first and second ceramic plates to connect to said fixed contacts with each other in each of the rows or columns of the matrix;
spring means carrying movable contacts made of a magnetic material and mounted on said base plate so that said movable contacts are positioned directly opposite to said respective fixed contacts for cooperation therewith;
a plurality of magnetic cores located adjacent said fixed contacts but on the opposite side of said first plate; and
a plurality of energizing windings encircling said cores, said magnetic cores and windings being operable to selectively drive said movable contacts in an axial direction of said through apertures into contact with the corresponding fixed contacts.

4,060,783

MAGNETIC CIRCUIT AND METHOD OF MAKING

John D. Harnden, Jr., Schenectady, N.Y., assignor to General Electric Co., Schenectady, N.Y.

Continuation-in-part of Ser. No. 412,341, Nov. 2, 1973, abandoned. This application Mar. 11, 1975, Ser. No. 557,386
Int. Cl.² H01F *1/08, 21/02*
U.S. Cl. 335—296 **13 Claims**



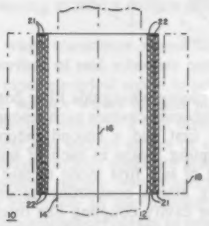
1. An electromagnetic circuit comprising:
a closed magnetic core having at least four substantially orthoganally interconnecting side members forming a generally rectangular structure of integral nonlaminar construction wherein at least one side of said core structure is of circular cross section;
a bobbin rotatably disposed about said circular side and in tight fitting engagement therewith, said bobbin comprising cylindrical complementary sections, said sections including flanges having drive means for forming a winding on said bobbin and interlocking means for locking said sections about said circular side; and
at least one conductive winding on said bobbin for providing highly efficient electromagnetic coupling between said core and said winding.

4,060,784

ELECTRICAL INDUCTIVE APPARATUS

Petter I. Fergestad, Konnerud, Norway, assignor to A/S National Industri, Drammen, Norway

Filed Nov. 22, 1976, Ser. No. 743,827
Claims priority, application Norway, Jan. 14, 1976, 760124
Int. Cl.² H01F *15/04, 27/28*
U.S. Cl. 336—84 R **14 Claims**



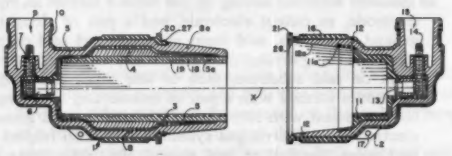
1. An electrical inductive apparatus comprising:
a magnetic core,
an electrical winding disposed in inductive relation around said core, said winding including a plurality of layers of non-magnetic, electrically conductive sheet material wound about a predetermined axis to provide a structure having first and second axial ends,
electrical terminals connected to said sheet material adapted for connection to a source of electrical potential,
a first magnetically conductive means disposed between at least certain of the layers of said conductive sheet material to provide a low reluctance path for magnetic flux in a direction parallel with said predetermined axis,
and a second magnetically conductive means, disposed between said first magnetically conductive means and said core, for providing a return path for said magnetic flux to said core.

4,060,785

ENCLOSING STRUCTURE FOR A HIGH VOLTAGE ELECTRIC FUSE

Kenneth Earl Hanke, Atlanta, and Ned Rees, Tucker, both of Ga., assignors to Kearney-National Inc., Atlanta, Ga.

Filed Sept. 13, 1976, Ser. No. 722,361
Int. Cl.² H01H *85/02*
U.S. Cl. 337—201 **15 Claims**



1. An enclosing structure for an electric fuse having a fusible element disposed within a tubular casing of insulating material

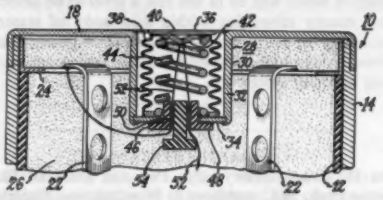
and interconnected at its ends with terminals mounted on the casing ends, said enclosing structure comprising an elongated enclosure formed of insulating and semiconducting material and disposed about said tubular casing and with its inner surface in heat transferring surface contacting relation therewith, and a rigid metallic heat absorbing sleeve embedded in said elongated enclosure for absorbing heat therefrom and for imparting a degree of mechanical strength thereto.

4,060,786

ELECTRIC FUSE WITH SEALED INDICATOR

Raymond Cuzzone, Pittsfield, Mass., assignor to General Electric Company, Philadelphia, Pa.

Filed Oct. 26, 1976, Ser. No. 735,184
Int. Cl.² H01H 85/30
U.S. Cl. 337—244 3 Claims



1. An electric fuse of the type having an insulating housing, electrically conductive terminal caps at opposite ends of the housing, at least one main fusible element inside the housing connecting together electrically the terminal caps, and an indicating mechanism at one of said terminal caps for indicating fusing of the main element, wherein the improvement comprises said indicating mechanism comprising:

an electrically conductive support cup having its rim aligned with, and adjacent, an opening in one of said terminal caps and rigidly fastened in position to said cap in electrical connection thereto;

an apertured insulating bushing plug fitted into an opening in the bottom of said support cup;

a bellows telescopingly disposed inside said support cup, said bellows having a closed end remote from the bottom of said support cup and being sealed hermetically to the bottom of said support cup at the other end to function as a sealed indicator button;

biasing means for forcing the closed end of said button away from the bottom of said support cup, and

an electrical resistance restraining wire passing through said aperture in said bushing plut to the inside of said support cup and being secured to the bottom of said button, said wire being also secured under tension at said bushing plug, so that said button is held by said wire against the biasing force of said spring, the portion of said wire on the outside of said support cup passing through the interior of said insulating housing of said fuse and being electrically connected between said terminal caps.

4,060,787

THERMAL SWITCH

Frederick Budnik, St. Paul, Minn., assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed Nov. 12, 1976, Ser. No. 741,216
Int. Cl.² H01H 37/76
U.S. Cl. 337—408 5 Claims

1. A thermal switch comprising:

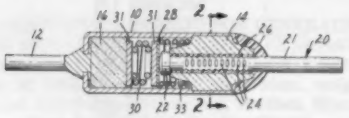
a tubular, electrically and thermally conductive metal casing,

a first electrically conductive lead joined to and extending from one end of said metal casing to seal off said one end and make electrical connection to said casing,

an insulative ceramic bushing at the opposite end of said casing, said bushing sealing said opposite end of said casing and having its bore coaxial with said casing,

a normally solid, fusible pellet within said casing adjacent to said one end,

a second electrically conductive lead having a generally cylindrical body extending through the bore of said ceramic bushing and out of said casing to permit electrical connection thereto, and having a head abutting the end of said ceramic bushing within said casing, said body of said second lead being formed with at least one radially-extending relief lying within the bore of said ceramic bushing, said relief extending around less than the entire



circumference of said body, said second lead being retained in said ceramic bushing by a sealing resin within the bore of said bushing around the body of said second lead,

an electrically conductive disk positioned within said casing between said fusible pellet and said head of said second lead coaxial with said casing, slidable axially within said casing and making electrical contact with the wall of said casing, and

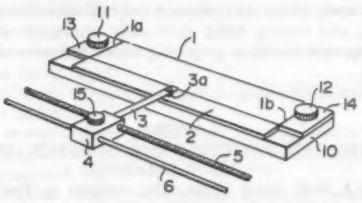
resilient means urging said disk into electrical contact with the head of said second lead when said fusible pellet is solid and away therefrom upon melting of said fusible pellet.

4,060,788

POTENTIOMETER

Saburo Numata, and Shinichiro Fujino, both of Urawa, Japan, assignors to Fuji Photo Optical Co., Ltd., Omiya, Japan

Filed Aug. 3, 1976, Ser. No. 711,362
Claims priority, application Japan, Aug. 6, 1975, 50-95634
Int. Cl.² H01C 10/16
U.S. Cl. 338—128 6 Claims

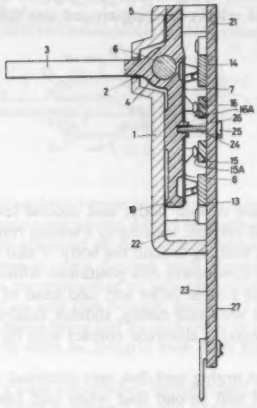


1. A potentiometer comprising a first resistor having input terminals at both ends thereof, said first resistor having a side edge extending between the input terminals, a second resistor extending along said side of the first resistor, said second resistor having a side which is in line contact with said side of the first resistor, the resistance of said first resistor being substantially lower than that of said second resistor, a movable contact slidable substantially parallel to said side of the first resistor in slidable contact with said second resistor to thereby establish a resistive path from said movable contact to the point on said first resistor nearest said movable contact, said movable contact having an output terminal fixed thereto and an amplifier connected to said output terminal of the movable contact, the input impedance of said amplifier being substantially greater than that of said resistive path.

4,060,789
MULTIPLE SLIDE RESISTOR

Walfried Achtmann, Bad Neustadt, Saale, and Gerhard Hochgesang, Lebenhan, both of Germany, assignors to Preh-Elektrofeinmechanische Werke - Jakob Preh Nachf, Bad Neustadt, Salle, Germany

Filed June 21, 1976, Ser. No. 698,022
Claims priority, application Germany, June 21, 1975, 7519719
Int. Cl.[2] H01C *10/44*
U.S. Cl. 338—183 5 Claims

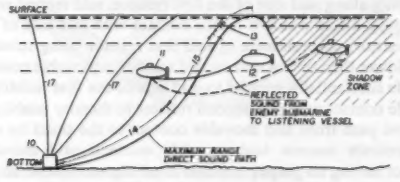


1. In a multiple slide resistor having a base plate that forms a bottom closure of a resistor housing provided with a slide slot, resistor units each including a resistance element and a collector element associated with said resistance element being attached to said base plate, each resistor unit being separated electrically from the other by means of a shielding, and a movable slide element common to all the resistor units and upon which a number of pairs of brush springs corresponding to the number of resistor units is fastened to produce an electrical connection between the resistance element and the collector element of each resistor unit, the improvement comprising said base plate having a conductive coating on at least the side thereof upon which the resistance and collector elements are located, said coating being electrically connected with the shielding, said shielding projecting above the pairs of brush springs.

4,060,790
METHOD OF DETECTING THE PRESENCE OF AN ENEMY SUBMARINE

Samuel J. Raff, Chevy Chase, Md., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Dec. 30, 1963, Ser. No. 334,666
Int. Cl.[2] G01S *9/66*
U.S. Cl. 340—3 R 6 Claims



1. The method of detecting the presence of an enemy submarine within a given body of water without revealing the position of a listening vessel outside said body of water to said enemy submarine which comprises the steps of:

submerging a self-contained sound source on the floor of the ocean on the central vertical axis of said body of water, said sound source having a sufficient power output to enable sound waves to be transmitted to an enemy submarine within said body of water and be reflected therefrom to points outside said body of water,

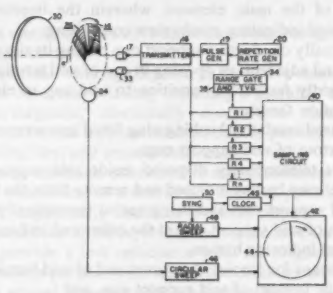
propagating a high intensity, nondirectional sound signal from said sound source within said body of water,

positioning a listening vessel a predetermined distance outside said body of water, said predetermined distance being that required for said listening vessel to detect an echo of a sound signal originating at said sound source and reflected from said enemy submarine, while the sound from the source reflected from said listening vessel into said body of water will be of too low a level to be detected at said enemy submarine within said body of water, and detecting an echo of a sound signal originating at said sound source and reflected from said enemy submarine at said listening vessel.

4,060,791
IMAGING SYSTEM

Charles H. Jones, Murrysville, Pa., and Dale D. Skinner, Severna Park, Md., assignors to Westinghouse Electric Corporation, Pittsburgh, Pa.

Continuation of Ser. No. 570,695, April 23, 1975, abandoned.
This application Oct. 28, 1976, Ser. No. 736,294
Int. Cl.[2] G01S *9/68, 7/62, 7/06*
U.S. Cl. 340—3 C 12 Claims



1. An imaging system comprising:

a. a plurality of receiving elements for receiving energy from a field of view;

b. said elements being operable to provide corresponding output signals upon receipt of said energy;

c. means for processing and displaying said signals as a picture of said field of view;

d. said elements being oriented relative to one another and said means for processing being operable to provide for relatively high resolution at the center of said field of view and reduced resolution away from said center.

4,060,792
HARD CLIPPED BEAM FORMER

Arent H. Kits van Heyningen, Newport, R.I., assignor to Raytheon Company, Lexington, Mass.

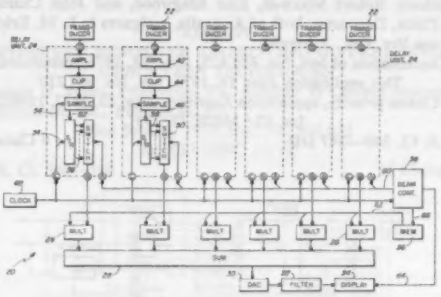
Filed June 17, 1976, Ser. No. 696,978
Int. Cl.[2] G01S *3/80*
U.S. Cl. 340—6 R 5 Claims

1. A beam forming system coupled to individual elements of an array of radiating elements, the beam forming system comprising:

means coupled to individual ones of said radiating elements

for clipping signals produced by said radiating elements in response to radiation incident thereupon;

means for weighting said clipped signals, individual ones of said clipping signals from individual ones of said radiating elements being multiplied by individual weighting factors, the magnitude of a weighting factor being dependent on the position of the corresponding one of said radiating elements relative to the orientation of a beam to be formed by said beam forming system, said weighting being accomplished by affixing a sign to weighting factors of said weighting means, said sign depending on the relative phases of signals incident upon said radiating elements of said array;



means coupled to said weighting means for summing together the weighted values of said signals; and

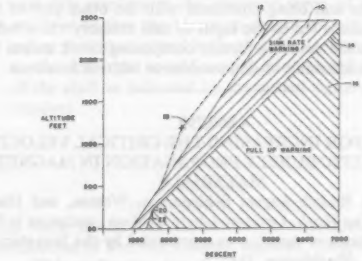
means coupled to said summing means for filtering the sum of the weighted clipped signals, said filtering means including a low pass filter for providing a continuous analog waveform.

4,060,793

EXCESSIVE SINK RATE WARNING SYSTEM FOR AIRCRAFT

Charles Donald Bateman, Bellevue, Wash., assignor to Sundstrand Data Control, Inc., Redmond, Wash.

Filed July 19, 1976, Ser. No. 706,518
Int. Cl.² G01C *5/00*
U.S. Cl. 340—27 R **20 Claims**



1. A warning system for use in aircraft having a source of signals representing the aircraft's barometric rate of descent and a source of signals representing the aircraft's altitude above terrain, comprising:

means for comparing the aircraft's barometric rate of descent with the aircraft's altitude above the terrain;

a first signal generating means, responsive to said comparing means, for generating a voice sink rate type of warning signal representing a condition wherein the aircraft is exceeding a descent rate according to a first predetermined, essentially linear, relationship between barometric descent rate and aircraft altitude above the terrain, wherein said first predetermined relationship has a slope of approximately 1,000 feet per minute for each 580 feet of altitude;

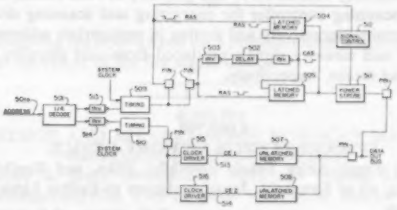
and a second signal generating means, responsive to said comparing means, for generating a voice pull-up type of warning signal representing a condition wherein the aircraft is exceeding a descent rate amounting to a second predetermined relationship between barometric descent rate and aircraft altitude above the terrain wherein said second predetermined relationship requires a lesser descent rate for a given altitude above the terrain than said first predetermined relationship.

4,060,794

APPARATUS AND METHOD FOR GENERATING TIMING SIGNALS FOR LATCHED TYPE MEMORIES

Paul S. Feldman, Newton; Robert B. Johnson, Billerica, and Chester M. Nibby, Jr., Peabody, all of Mass., assignors to Honeywell Information Systems Inc., Waltham, Mass.

Filed Mar. 31, 1976, Ser. No. 672,103
Int. Cl.² G06F *13/00*
U.S. Cl. 364—900 **9 Claims**



1. In a computer system having a power supply, a system clock, a data bus, a main memory of the latched type having first enabling means and responsive to said first enabling means wherein data out is latched to the data bus and remains latched to said data bus for a full memory cycle of said main memory, said main memory also having second enabling means for presenting a high impedance to said data bus when no electric signal is applied to said second enabling means from said power supply, an interface apparatus for generating an electronic pulse for causing the data out to be unlatched from said data bus prior to the end of the memory cycle, said interface apparatus comprising:

first means responsive to said system clock for generating a first timing signal;

second means responsive to said first means for delaying said first timing signal;

third means coupled to said first and second means for inverting said timing signal, whereby a second timing signal is generated; and,

fourth means coupled to said third means and second enabling means in said main memory and responsive to said second timing signal for removing electronic power from said second enabling means,

whereby a high impedance is presented to said data bus thus unlatching the data out from said data bus.

4,060,795

SCANNING SYSTEM

Akinori Harumiya, and Koki Toyosawa, both of Yokohama, Japan, assignors to Hitachi, Ltd., Japan

Continuation-in-part of Ser. No. 444,565, Feb. 21, 1974, abandoned. This application Aug. 17, 1976, Ser. No. 715,158
Claims priority, application Japan, Feb. 23, 1973, 48-21293
Int. Cl.² G11C *11/40*
U.S. Cl. 364—900 **2 Claims**

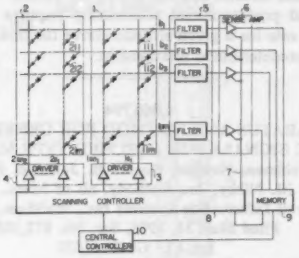
1. A scanning system comprising:

a. a scanning matrix including a multiplicity of columns and

rows and points to be scanned, each of said points being connected to each of the intersections of said columns and rows;

b. a plurality of scanning drive circuits connected to said columns of said scanning matrix, respectively:

c. a plurality of read means connected to the rows of said scanning matrix;



d. a memory connected to said plurality of read means; and

e. a scanning controller for energizing said scanning drive circuits successively and storing in appropriate addresses of said memory signals produced from said plurality of read means, respectively.

4,060,796

SEMICONDUCTOR MEMORY DEVICE

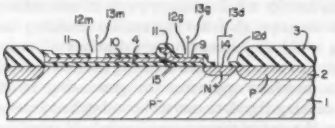
Ryoiku Togei; Akira Takei; Yoshihiko Hika, and Kunihiko Wada, all of Kawasaki, Japan, assignors to Fujitsu Limited, Japan

Division of Ser. No. 675,196, April 8, 1976. This application Jan. 11, 1977, Ser. No. 758,447

Claims priority, application Japan, Apr. 11, 1975, 50-43388

Int. Cl.² G11C *11/40*

U.S. Cl. 365—183 **8 Claims**



1. A semiconductor memory device for reading and writing data in response to selected input signals, comprising in combination:

a semiconductor material substrate having a first conductivity and including, adjacent to a given surface thereof, a doped region of a second conductivity opposite to said first conductivity, and further including a gate region adjacent to said doped region, and a memory cell region adjacent to said gate region and remote from said doped region;

memory cell electrode means disposed above said given surface and above said memory cell region, and responsive to said selected input signals for respectively assuming one of a plurality of potentials;

gate electrode means disposed above said given surface and above said gate region, and responsive to said selected input signals for respectively assuming one of said plurality of potentials; and

insulation means between said memory cell and gate electrode means, and said substrate, for electrically shielding the latter from the former;

said gate electrode means including, immediately adjacent to said memory cell electrode means, a resistive means for establishing a linear potential transition from the potential of said gate electrode means to that of said memory cell electrode means;

whereby, in response to said selected input signals, electrical charge is selectably transferred to and from said doped region, respectively, from and to said memory cell region, in a speedy manner.

4,060,797

SERIAL DIGITAL BIT STREAM CODE DETECTOR

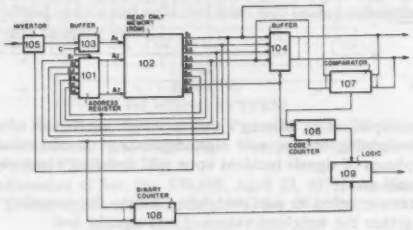
Anthony Robert Maxwell, East Ringwood, and John Charles Platts, Doncaster, both of Australia, assignors to L. M. Ericsson Pty. Ltd., Australia

Continuation of Ser. No. 415,425, Nov. 13, 1973, abandoned. This application June 16, 1975, Ser. No. 587,210

Claims priority, application Australia, Nov. 13, 1972, 1198/72

Int. Cl.² H03K *13/256*

U.S. Cl. 340—347 DD **8 Claims**



1. A code detector for detecting the presence or absence of particular sequences of data serial bits in a digital bit stream, comprising a memory adapted to sequentially receive said data bits, each location of said memory being programmed to contain one part of the address of two or more further locations in the memory, the other part of the address being provided by a bit in said serial digital bit stream to cause said memory to address successive locations dependent upon the data bit received, said memory being adapted to provide a first output signal representative of said one part of the address of two or more further locations, and a second output signal indicating when predetermined locations are reached, said output signifying the presence of a particular sequence, said first output signal being fed back to the input of said memory via an address register and being combined with the other part of the address which is fed to the input of said memory via a buffer store, said code detector further comprising clock means for timing the addressing of said successive address locations.

4,060,798

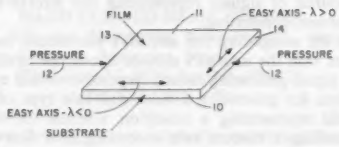
METHOD FOR INCREASING THE CRITICAL VELOCITY OF MAGNETIC BUBBLE PROPAGATION IN MAGNETIC MATERIALS

Ernst Fritz Rudolf August Schloemann, Weston, and Harry Jerrold Van Hook, Lexington, both of Mass., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed May 12, 1976, Ser. No. 685,877

Int. Cl.² G11C *19/08*

U.S. Cl. 365—25 **2 Claims**



1. Apparatus for use in magnetic bubble devices so as to

increase the frequency at which said bubble devices can operate, comprising in combination

a substrate;

a magnetic film formed on one surface of said substrate, the composition of said magnetic film being such that magnetic bubbles may be created and propagated therein; and

means for maintaining within said magnetic film a uniaxial strain-induced, in-plane, easy axis of magnetization.

4,060,799

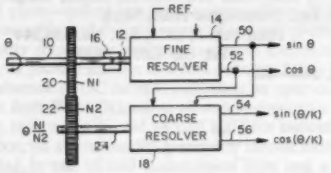
TWO-SPEED RESOLVER EMPLOYING DIFFERENTIAL REDUCTION TECHNIQUES

Donald H. Jones, Pittsburgh, Pa., assignor to Control Systems Research, Inc., Pittsburgh, Pa.

Filed Sept. 5, 1974, Ser. No. 503,431

Int. Cl.[2] G08C *19/48*

U.S. Cl. 340—198 **12 Claims**



1. A two-speed resolver for indicating the exact position of a shaft rotatable through multiple revolutions comprising:

a first brushless resolver having a mechanical input connected to the shaft and an electrical output providing a signal indicating the position of the shaft;

a second brushless resolver having a mechanical input, an electrical input, and an electrical output;

mechanical connecting means connecting the mechanical input of said first resolver to the mechanical input of said second resolver for moving the mechanical input of said second resolver at a different rate than the mechanical input of said first resolver as the shaft is rotated;

electrical connecting means for feeding the signals indicating the position of the shaft from the electrical output of said first resolver to the electrical input of said second resolver so that the electrical output of said second resolver provides a signal indicating the algebraic sum of the mechanical input to said second resolver and the position of the shaft as indicated by the output signal of said first resolver

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4,060,800

FIRE ALARM DEVICE

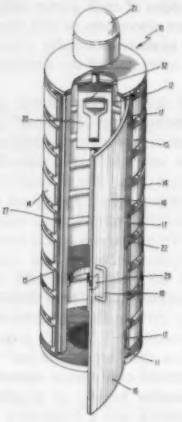
Philip Stern, 200 E. 27th St., New York, N.Y. 10016

Continuation of Ser. No. 136,093, April 21, 1971, abandoned. This application Aug. 7, 1975, Ser. No. 602,636

Int. Cl.[2] G08B *21/00*

U.S. Cl. 340—304 **12 Claims**

1. In a fire alarm system, the improvement which comprises a fire alarm device, and a mechanism for ensuring the presence of the one who has operated the alarm device at such device for a predetermined length of time, said mechanism comprising an enclosure in which the alarm device is mounted, said enclosure having an opening for the entry and exit of said operator of the fire alarm device, the alarm device being so disposed in the enclosure so that the operator must be within the enclosure before he can operate the alarm device, a door for selectively closing the opening, means responsive to at least the partial open position of the door for preventing operation of the fire alarm device unless the door is closed, and means actuated by the operation of the fire alarm device for locking the door and



maintaining the door locked for a predetermined length of time after operation of the fire alarm device.

4,060,801

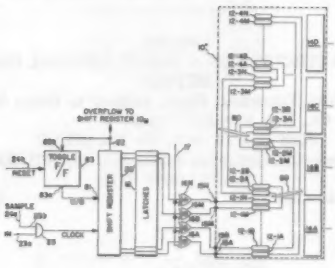
METHOD AND APPARATUS FOR NON-SCAN MATRIX ADDRESSING OF BAR DISPLAYS

Charles R. Stein, Schenectady, N.Y., and William L. Carl, Montgomeryville, Pa., assignors to General Electric Company, Schenectady, N.Y.

Filed Aug. 13, 1976, Ser. No. 714,255

Int. Cl.[2] G06F *3/14*

U.S. Cl. 340—324 R **30 Claims**



1. A method for the non-scanned matrix addressing of a display having a bar of variable length in a first light-transmissive condition continuously during all of a time interval between each change, responsive to only an external stimulus, of the length thereof, the display comprised of a plurality (Y) of common electrodes, a like plurality (Y) of groups each containing a plurality (N) of data segment electrodes associated with each common electrode, and a plurality (N Y) of consecutive portions of a display element with each portion being associated with one of the plurality of data segment electrodes and the common electrode associated therewith and actuateable between respective first and second light-transmissive conditions responsive to respective first and second magnitudes of a selected electrical parameter established between the associated data segment and common electrodes, comprising the steps of:

a. simultaneously driving selected ones of the data segment electrodes of each group only with a continuous data-true square-waveform of said electrical parameter, said data-

true waveform having a first amplitude and a substantially constant first frequency;

b. simultaneously driving the remaining ones of the data segment electrodes of each group only with a continuous data-false square-waveform of said electrical parameter of essentially the same substantially constant frequency and essentially the inversion of the amplitude of the data-true waveform;

c. simultaneously driving the common electrode associated with a transistional "top-of-the-bar" group of data segment electrodes only with a continuous first squarewaveform which is essentially the data-false waveform, to cause the selected parameter to continuously be of the first magnitude between said transitional common electrode and the associated data segment electrodes having the data-true waveform thereon and to continuously be of said second magnitude between said transitional common electrode and the associated data segment electrodes having the data-false waveform thereon;

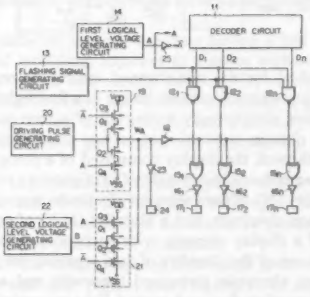
d. simultaneously driving the common electrode associated with each subordinate "full-on" group of data segment electrodes below the "top-of-the-bar" common electrode only with a second continuous square-waveform of said electrical parameter having an amplitude differing from said first waveform and a frequency equal to one of an even-integer multiple and an even-integer submultiple of the frequency of the first waveform, to cause said electrical parameter to continuously be substantially of said first magnitude between each subordinate common electrode and the entire group of data segment electrodes associated therewith; and

e. simultaneously driving each common electrode associated with each "off" group of data segment electrodes above the "top-of-the-bar" common electrode only with a third continuous square-waveform of said selected electrical parameter having a frequency higher than a cut-off frequency of the display element to cause said electrical parameter to continuously be substantially of said second magnitude between each common electrode and the entire group of data segment electrodes associated therewith.

4,060,802
DRIVING CIRCUIT FOR A LIQUID CRYSTAL DISPLAY DEVICE

Koji Matsuki, Yokohama, Japan, assignor to Tokyo Shibaura Electric Co., Ltd., Kawasaki, Japan

Filed June 23, 1976, Ser. No. 699,187
Claims priority, application Japan, June 24, 1975, 50-78051
Int. Cl.² G09F 9/32
U.S. Cl. 340—324 M **5 Claims**

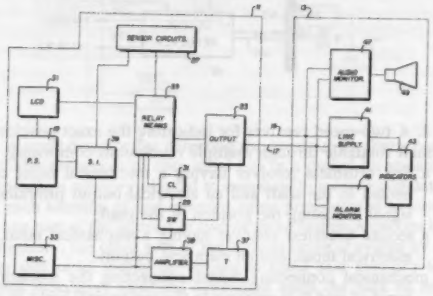

FIRST LOGICAL LEVEL VOLTAGE GENERATING CIRCUIT
DECODER CIRCUIT
FLASHING SIGNAL GENERATING CIRCUIT
DRIVING PULSE GENERATING CIRCUIT
SECOND LOGICAL LEVEL VOLTAGE GENERATING CIRCUIT

1. A driving circuit for a liquid crystal display device for causing the segment electrodes of a liquid crystal element to indicate prescribed data, which comprises a plurality of multi-input type NAND gates supplied with outputs from a decoder circuit for decoding coded data; a first logical level voltage-generating circuit for impressing prescribed logical level voltage in common to the NAND gates; a plurality of exclusive OR gates supplied with outputs from the NAND gates; a driving pulse-generating circuit for supplying liquid crystal-driving pulses to the exclusive OR gates; a second logical level voltage-generating circuit for sending forth an output to the exclusive OR gates, thereby producing prescribed logical level voltage; and switch circuit provided between the driving pulse-generating circuit or second logical level voltage-generating circuit and the exclusive OR gates, whereby the segment electrodes of a liquid crystal display element are selectively supplied with liquid crystal-driving pulses generated by the driving pulse-generating circuit or prescribed logical level voltage according to the combinations of logical level voltage outputs from the first and second logical level voltage-generating circuits.

4,060,803
SECURITY ALARM SYSTEM WITH AUDIO MONITORING CAPABILITY

Charles S. Ashworth, Jr., Warren, Mich., assignor to Audio Alert, Inc., Farmington Hills, Mich.

Filed Feb. 9, 1976, Ser. No. 656,244
Int. Cl.² G08B 29/00
U.S. Cl. 340—409 **12 Claims**



1. A security alarm system comprising, in combination, a remotely located station to be protected, a central monitoring station and electrical transmission lines coupled therebetween, said remote station including output means coupling said remote station to said transmission lines, means for generating a DC transmission signal having a first normal polarity, first relay responsive switching means normally coupling said generated DC signal of said first normal polarity to said output means, a line current detector including a photo-optical coupler having a photo diode coupled between said generating means and said first switching means, said photo diode being responsive to the normal passage of current therethrough for maintaining its phototransistor in a first conductive state and responsive to the absence of current therethrough to switch its phototransistor to a second conductive state, indicator means at said remote station responsive to said second conductive state for providing a visual indication of the failure to transmit said DC transmission signal, a plurality of alarm condition sensors normally maintaining a first normal condition but triggerable to a second alarm condition in response to the detection of said alarm condition, a normally de-energized relay responsive to said second alarm condition for energizing its coil to switch said first relay responsive switching means to reverse the normal polarity of the DC signal supplied to said output means, a manually operable multipositionable switch located at said remote station, said switch being positionable to at least an "on" and an "off" state, microphone detector means including a plurality of individual microphones located about said remote station for detecting audible sounds originating therein, each of said microphones having its own amplifying means and means for adjusting its individual sensitivity, said microphone detector means further including a high gain

amplifier for further applying the AC outputs of said microphones, a transformer means for superimposing the amplifier AC audio signal onto the DC transmission signal at said output means, means responsive to said manually-operable switch oeing in the "on" position for supplying necessary power to said microphones, supplemental second relay responsive switching means responsive to the energization of said relay means in response to the detection of an alarm condition for supplying the necessary power to said microphones even if said manually-operable switch is in the "off" position, closed loop means activated when said manually-operable switch is in said "on" position, for maintaining a first closed circuit state so long as no part of the perimeter security loop is broken but responsive to a break in the security loop for switching to a second closed circuit state, said relay means being further responsive to said second closed circuit state for energizing the relay coil to reverse the polarity of the DC transmission signal supplied to said output means, said central monitoring station comprising a line supervision circuit including a full wave rectifier coupled to said transmission lines for providing a continuous DC signal to a photo-optical coupler for isolating said central station, said photo-optical coupler having a photo diode coupled in series with said full wave rectifier, said photo diode being normally responsive to the presence of DC current for maintaining its phototransistor in a first state but being responsive to the absence of DC current indicating an open circuit or short circuit fault for switching its phototransistor to a second state, means responsive to said second state for indicating the fault condition, an alarm condition monitor circuit including a diode coupled to one of said transmission lines and a photo-optical coupler in series with said diode for isolating said central station, said photo-optical coupler having a photo diode having its anode connected in series with the cathode of said diode such that said photo diode does not conduct when a DC signal of normal polarity is present on the lines so as to maintain its phototransistor in a first normal state indicating the absence of an alarm condition and such that said photo diode does conduct in response to a DC signal of reversed polarity on said lines so as to switch its phototransistor to a second alarm state indicating the presence of an alarm condition at said remote station, means including an SCR responsive to said second alarm state for switching said SCR to a conducting state, means responsive to said SCR being in said conducting state for indicating the existence of said alarm condition, and means for manually resetting said SCR to its non-conductive state after the alarm condition has been corrected at said remote station, and an audio monitoring circuit including a transformer for isolating the central station from the transmission lines, a DC blocking capacitor coupling a first transformer winding to said transmission lines, an audio amplifier having its inputs coupled to the second transformer winding, a threshold amplifier having its input coupled to one of the inputs of said audio amplifier for outputting a gating signal when the audio signal exceeds a predetermined threshold level, an audio gating means having its input coupled to the output of said audio amplifier and responsive to said gating signal from said threshold amplifier for passing the output from said audio amplifier and speaker means coupled to the output of said audio gating means for rendering the audio signals passed by said gating means audible to an operator at the central station so as to enable the operator to listen to the actual audio sounds originating in the protected remote location.

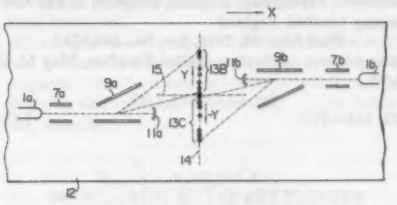
4,060,804

INK JET RECORDING METHOD AND APPARATUS

Takahiro Yamada, Hitachi, Japan, assignor to Hitachi, Ltd., Japan

Filed Jan. 30, 1976, Ser. No. 653,928
Claims priority, application Japan, Feb. 3, 1975, 50-14505
Int. Cl.² G01D *15/18*
U.S. Cl. 346—1 **10 Claims**

1. An ink jet recording method for recording a continuous pattern by the synthesis of two record patterns split in a direction of deflection of ink droplets, wherein said two split record patterns are formed by deflecting first ejected ink droplets and second ejected ink droplets individually from each other and respectively in opposite senses of the ink droplet deflection



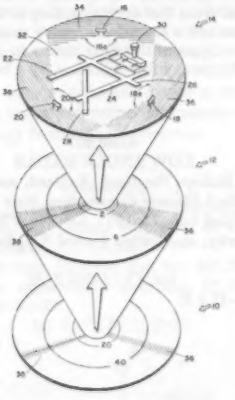
direction, and said two split record patterns are seamed together along their edges which are defined by the ink droplets deflected with a smaller angle.

4,060,805

INTEGRATED TERMINAL AREA SURVEILLANCE SYSTEM

Arthur D. McComas, Cockeysville, Md., assignor to The Bendix Corporation, Southfield, Mich.

Filed June 28, 1976, Ser. No. 700,433
Int. Cl.² G01S *9/56*
U.S. Cl. 343—6.5 LC **7 Claims**



5. A surveillance system for an airport terminal control area including a plurality of spaced apart interrogating and receiving stations and wherein transponder equipped aircraft cooperate with said stations, said stations being able to direct an interrogation message into a selected portion of said terminal control area and determine, in response to a reply to said interrogation message, the location of a transponder equipped aircraft which replies to said interrogation message by any of a plurality of algorithms for determining location in response to a reply to an interrogation and additionally including means for recording the location of said transponder equipped aircraft which replies to said interrogation message; and, means responsive to the recorded location for selecting which of said plurality of algorithms is to be used for determining the location of said aircraft in response to a subsequent reply.

4,060,806

PHASED ARRAY RADARS

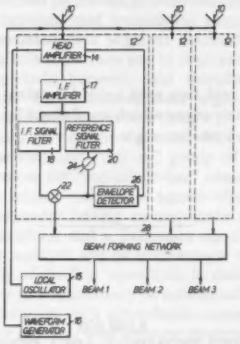
Eric Davies, deceased, late of Danbury, England (by Olivia Maude Davies, co-executor), and by Douglas Philip Marr, co-executor, Mevagissey, England, assignors to The Marconi Company Limited, England

Filed May 14, 1976, Ser. No. 686,574

Claims priority, application United Kingdom, May 14, 1975, 20243/75

Int. Cl.[2] G01S 7/40

U.S. Cl. 343—17.7 7 Claims



1. A radar having a plurality of antennae, a plurality of receiving channels each associated with a respective antennae and including an amplifier and a first frequency mixer/generator, means for providing a reference signal of known frequency which is different from the radar carrier frequency to the input of each receiving channel, filter means in each receiving channel for separating the I.F. frequency corresponding to the reference signal from that corresponding to the signal induced in the antennae and a second frequency mixer for mixing the signals at the outputs of the filter means to generate a second intermediate frequency for utilisation by a beam forming network.

4,060,807

LOW ANGLE RADAR

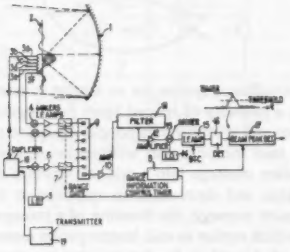
Paul Barton, Bishops Stortford, England, assignor to International Standard Electric Corporation, New York, N.Y.

Filed Feb. 22, 1977, Ser. No. 770,404

Claims priority, application United Kingdom, Feb. 24, 1976, 07210/76

Int. Cl.[2] G01S 7/28

U.S. Cl. 343—17.1 R 7 Claims



1. A receiving system for a pulse radar system comprising:
range gate controlled means for simultaneously sampling the return signal distribution across a predetermined portion of the receiving aperture;
means for combining in time distributed order, said combined samples producing a coherent signal waveform corresponding to a time scan of the received signal distribution across said predetermined aperture portion and having a signal spectrum which is representative of said aperture distribution;
and means for filtering said waveform such as to attenuate the edges of the signal spectrum.

4,060,808

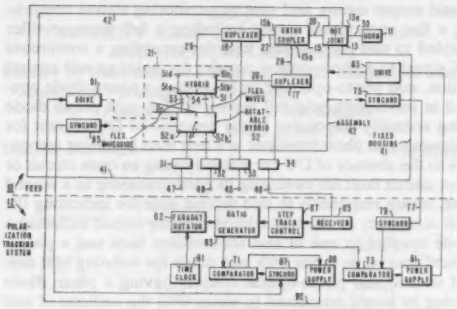
ANTENNA SYSTEM WITH AUTOMATIC DEPOLARIZATION CORRECTION

Peter Foldes, Montreal, Canada, assignor to RCA Corporation, New York, N.Y.

Filed June 30, 1976, Ser. No. 701,422

Int. Cl.[2] H04B 7/00

U.S. Cl. 343—100 PE 12 Claims



1. In an antenna system of the type including means for providing maximum coupling of radio frequency waves of a given polarization, the improvement therewith for automatically correcting for changes in the rotation of the polarization of waves when travelling through the ionosphere to maintain polarization alignment comprising:
means for locally generating a continuous control signal which represents the nominal amount of Faraday rotation that then exists for a radio frequency wave at a given frequency in the region of the antenna site, and
means responsive to said control signal for adjusting the polarization angle of the coupling means in accordance with said control signal to maintain alignment.

4,060,809

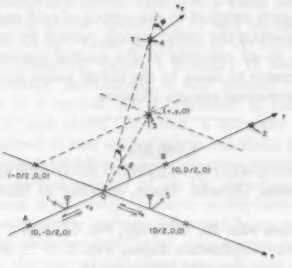
TRACKING AND POSITION DETERMINATION SYSTEM

Elie J. Baghdady, 21 Overlook Drive, Weston, Mass. 02193

Filed Apr. 9, 1975, Ser. No. 566,195

Int. Cl.[2] G01S 1/40, 3/54, 5/04; G08G 5/00

U.S. Cl. 343—112 R 43 Claims



42. A method of determining the position of an object relative to known reference location, comprising the steps of:

radiating carrier waves from along two at least partially non-parallel lines at one of the object and the known reference location by varying the location of at least one radiating position to induce Doppler shift in the carrier waves;

receiving the carrier waves at at least two antennae spaced apart at the other of the object and the known location;

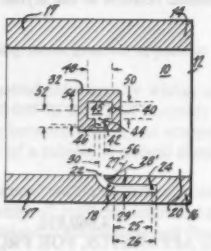
sensing the Doppler shift of the carrier waves received at each of the antennae; and,

calculating the position of the object from the sensed Doppler shifts, the separation of the two antennae and the coordinates of the known reference location.

4,060,810
LOADED MICROSTRIP ANTENNA

John L. Kerr, Neptune, and Michael J. Timochko, Lanoka Harbor, both of N.J., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Oct. 4, 1976, Ser. No. 729,513
Int. Cl.² H01Q *1/38*
U.S. Cl. 343—700 MS **10 Claims**



1. In a microstrip antenna, apparatus comprising:

a circuit board of dielectric material having a metallic ground plane on one side thereof; and

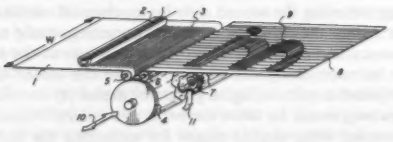
a radiating element in the form of a patch of metal etched on the opposite side of said board;

a microstrip transformer etched on said opposite side of said board continuous with said patch at the center of one side for coupling a transmission line and matching impedance to the patch; said patch being continuous thereacross except for the removal of a relatively large portion in the central region thereof, so that current flow across the patch is forced to deviate around the area of removal and therefore have a longer path, which lowers the resonant frequency of radiation.

4,060,811
MAGNETIC LATENT IMAGE CREATION

Eugene C. Faucz, Webster, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Filed Mar. 1, 1976, Ser. No. 662,628
Int. Cl.² G03G *19/00*
U.S. Cl. 346—74.1 **15 Claims**



1. A method for creating a magnetic latent image capable of being rendered visible with magnetic toner without image deletion, comprising:

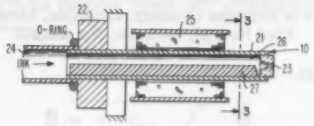
a. recording over an entire area of interest on a magnetizable member a first substantially uniform spatial pattern of magnetic transitions having a transition wavelength λ_1 capable of retaining said magnetic toner on said magnetizable member and effective to substantially completely cover said area of interest upon development with magnetic toner; and

b. recording in one of imagewise and background configuration within said area of interest a second spatial pattern of magnetic transitions having a wavelength λ_2 incapable of retaining said magnetic toner on said magnetizable member, wherein $\lambda_1 > \lambda_2$.

4,060,812
NOZZLE FOR AN INK JET PRINTER

John Mako, Endicott, and Walter Thornton Pimbley, Vestal, both of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Nov. 15, 1976, Ser. No. 741,825
Int. Cl.² G01D *15/18*
U.S. Cl. 346—75 **10 Claims**



1. In an ink jet printer system wherein ink under pressure flows through a nozzle device and an electromechanical transducer is operated at a predetermined frequency for vibrating said nozzle device for applying perturbations to said ink as it flows through said nozzle and is emitted as a continuous stream to break into discrete drops as a result of said perturbations,

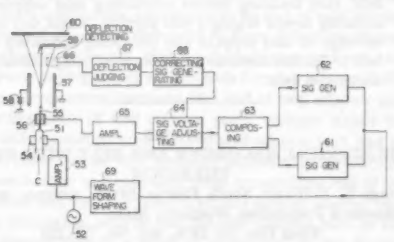
said vibration of said nozzle device by said transducer operation resulting in the production of soundwaves within the body of said ink in said nozzle, the improvement comprising

damper means within said nozzle device in contact with said body of ink contained within said nozzle device for absorbing energy from said soundwaves.

4,060,813
INK DROP WRITING APPARATUS

Takahiro Yamada, and Tetsuo Doi, both of Hitachi, Japan, assignors to Hitachi, Ltd., Japan

Filed Mar. 17, 1976, Ser. No. 667,588
Claims priority, application Japan, Mar. 17, 1975, 50-31212; Mar. 19, 1975, 50-32355
Int. Cl.² G01D *18/00*
U.S. Cl. 346—75 **13 Claims**



1. In an ink drop writing apparatus including a high frequency voltage source, nozzle means supplied with ink under pressure for generating an ink stream directed toward a recording medium, electro-mechanical converter means con-

nected to said high frequency voltage source for vibrating said nozzle means to cause the ink stream to break up into a stream of regularly spaced ink drops, means for generating recording signals, means for charging the drops in accordance with the charge therein, means responsive to the recording signals for applying a signal voltage to said charging means, and means for deflecting the drops in accordance with the charge thereon, the improvement comprising

a. calibrating means for controlling said charging means to apply a predetermined charge to selected drops;

b. means for detecting the amount of deflection of the selected drops and the deviation of the measured detection from a standard value; and

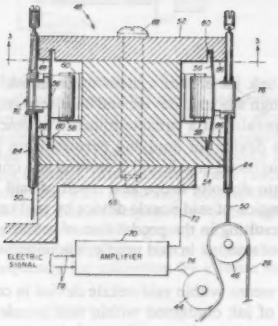
c. correcting means responsive to said detecting means for regulating said charging means to compensate the amount of charge applied to the selected drops to eliminate said deviation, said correcting means including signal voltage adjusting means for regulating the magnitude of said signal voltage.

4,060,814

RECORDER WITH EDGE-GUIDED BELT

John P. Urciuoli, and Roger P. Icart, both of Portsmouth, R.I., assignors to Raytheon Company, Lexington, Mass.

Filed Nov. 25, 1975, Ser. No. 635,207
Int. Cl.[2] G01D *15/16*
U.S. Cl. 346—139 A **13 Claims**



1. A recorder comprising:

a medium for inscribing a record;

a stylus for stimulating said medium; and

means for transporting said stylus along said medium, said transporting means including a belt having first and second edges thereof, a support having slots oriented transversely of said medium for slidably engaging said first and said second edges, and means for securing said stylus to said belt between said first and said second edges, said slots being configured to envelop only the edges of said belt, said securing means contacting said support, said securing means urging a mid-portion of said belt towards an edge of said support and providing a bowing of said belt to further stabilize said belt from longitudinal waves along said belt.

4,060,815

ELECTRICAL RECORDER AND BELT WITH STYLI THEREFOR

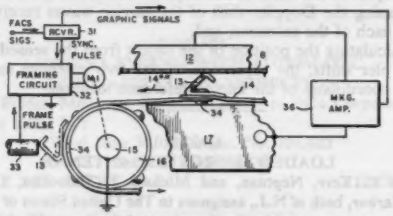
George C. Williams, South Easton, Mass., assignor to Alden Research Foundation, Westboro, Mass.

Filed Dec. 29, 1976, Ser. No. 755,211
Int. Cl.[2] G01D *15/16*
U.S. Cl. 346—139 A **9 Claims**

1. In graphic recording of electric signals on a web fed through a recording zone, means for scanning the zone comprising:

a belt having a plurality of equally spaced feed elements between belt ends, and mutually registered coupling perforations at each end in predetermined relation to the equal feed element spacing,

a signal marking stylus having apertures registerable with the belt coupling perforations, and



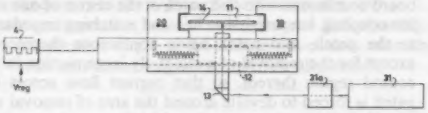
means extending through the stylus apertures and coupling perforations for fastening the stylus to the belt and also joining the belt ends with the feed elements of the joined ends at the aforesaid equal feed element spacing and in predetermined relation to the stylus.

4,060,816

SCANNING APPARATUS, FOR PRODUCING MASKS FOR MICRO CIRCUITS

Gerhard Westerberg, Hastskovagen 7A, 183 50 Taby, Sweden

Filed Feb. 9, 1976, Ser. No. 656,282
Claims priority, application Sweden, Feb. 13, 1975, 7501605
Int. Cl.[2] G03B *27/00*
U.S. Cl. 354—4 **3 Claims**



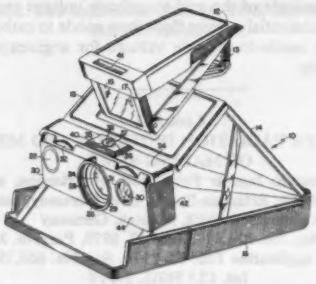
1. In a device for mechanically scanning a surface (14) on which a mask pattern is adapted to be generated in the manufacture of micro circuits, having a source of radiation (31), a radiation sensitive medium on said surface, a first slide (11) carrying said surface, a drive device (23) for reciprocating the first slide in one direction, a second slide (12), means (13) carried by the second slide for transmitting radiation from said source to the radiation sensitive medium on said surface, and drive means connected to the second slide for reciprocation thereof in another direction to scan said surface, comprising means mounting the second slide for mechanical vibration at a natural frequency, pulsing means (9) operating at said natural frequency and elastically coupled continuously to the second slide for maintaining said reciprocation of the second slide at an adjusted amplitude, signal generator means (4) connected to the pulsing means for drive thereof at said natural frequency of the second slide, sensing means for measuring the period of reciprocation of the second slide, and feedback control means connecting the sensing means to the signal generator means for maintaining said reciprocation of the second slide at the adjusted amplitude.

4,060,817

PHOTOGRAPHIC APPARATUS WITH LENS FOCUSING SCALE

Leonard J. Dionne, Westwood, Mass., assignor to Polaroid Corporation, Cambridge, Mass.

Filed Mar. 1, 1976, Ser. No. 662,352
Int. Cl.[2] G03B 3/00, 13/02
U.S. Cl. 354—198 10 Claims



1. A variable focusing photographic apparatus comprising:
a housing;
a lens assembly mounted substantially within said housing;
focusing means coupled to said lens assembly for moving said lens assembly between distant and nearmost foci so as to focus an image of a subject at a focal plane within said housing;
a viewing station formed within a surface of said housing;
an indicia-bearing strip of resilient material having a normally coiled unstressed configuration and first and second opposed ends; and
means for supporting said strip for movement across said viewing station, said supporting means including a rotatable member driveable coupled to said lens assembly or said focusing means, means for fixedly attaching said first end of said strip to said rotatable member and a fixed member around which said second end of said strip is unattachably coiled whereby said strip is coiled about said rotatable member and partially uncoiled from said fixed member when said focusing means is driven in a first direction, and said strip is automatically recoiled around said fixed member and partially uncoiled from said rotatable member when said focusing means is driven in a second direction opposite to said first direction.

4,060,818

SWITCH OPERATING DEVICE OPERATIVELY ASSOCIATED WITH A RECIPROCALLY MOVABLE MEMBER

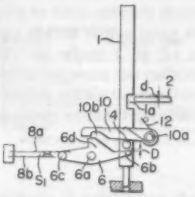
Koichi Furuta, Tokyo, Japan, assignor to Nippon Kogaku K.K., Tokyo, Japan

Filed Nov. 4, 1975, Ser. No. 628,653
Claims priority, application Japan, Nov. 14, 1974, 49-137060[U]
Int. Cl.[2] G03B 17/38
U.S. Cl. 354—266 9 Claims

1. In a photographic camera having a power-operated film advance mechanism energized when the camera shutter is in its closed position upon the closing of a control switch, the closure of the control switch being controlled by a reciprocally movable member that releases the shutter of the camera only after the reciprocally movable member has been moved in one direction from an initial position and substantially beyond a predetermined location, a device for operating the control switch comprising:

a. an actuating member operatively associated with the switch and having a first position in which the switch is maintained closed, but movable out of said first position for opening the switch;

b. operating means for moving the actuating member out of its first position only when said reciprocally movable member has moved in said one direction to said predetermined location; and



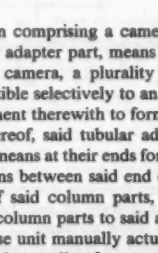
c. a holding member for holding the actuating member out of its first position until said reciprocally movable member returns in the opposite direction to substantially its initial position.

4,060,819

DETACHABLE CONNECTIONS FOR CAMERA OR THE LIKE

Gerhard I. W. Bahnsen, Box 1297, South Lake Tahoe, Calif. 95705

Division of Ser. No. 452,239, March 22, 1974, Pat. No. 3,945,738. This application May 5, 1975, Ser. No. 574,603
Int. Cl.[2] G03B 17/00
U.S. Cl. 354—293 4 Claims

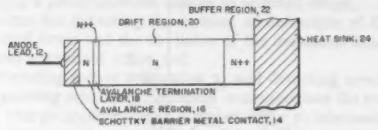


4. The combination comprising a camera having a shutter mechanism, a tubular adapter part, means for connecting said adapter part to said camera, a plurality of tubular support column parts connectible selectively to an end of said adapter part in general alignment therewith to form differently dimensioned extensions thereof, said tubular adapter part and said column parts having means at their ends forming telescopically interfitting connections between said end of said adapter part and coacting ends of said column parts, fastener means for locking said support column parts to said adapter part, and an elongated cable release unit manually actuable to operate said shutter mechanism and extending from an actuating end of the cable release unit into the interior of said tubular adapter part and then through a wall of said tubular adapter part to the exterior thereof and to a point of connection to the shutter mechanism, said adapter part having an upper end receivable upwardly within a downwardly opening socket recess in the camera, said first mentioned means including a fastener carried by a lower portion of said adapter part and slidably receivable within a slot formed in a lower portion of the camera upon upward movement of said adapter part into said socket recess.

4,060,820
LOW NOISE READ-TYPE DIODE

Robert A. Pucel, Needham, and Hermann Statz, Wayland, both of Mass., assignors to Raytheon Company, Lexington, Mass.

Filed Jan. 5, 1976, Ser. No. 646,101
Int. Cl.² H01L 29/90, 29/48
U.S. Cl. 357—13 20 Claims

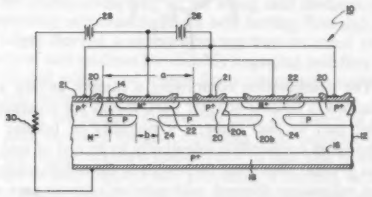


1. A Read-type diode comprising in combination:
a Schottky-barrier forming metal contact;
an avalanche region of semiconductor material adjacent said Schottky-barrier forming metal contact, said avalanche region having a doping density in the range of 5×10^{15} to $1 \times 10^{17}/cm^3$;
an avalanche termination region of semiconductor material adjacent said avalanche region, said avalanche termination region having a doping density in the range of 2×10^{17} to $5 \times 10^{17}/cm^3$, said avalanche termination region being of sufficient thickness to reduce the electric field within said avalanche termination region below the level sufficient for causing charge carrier multiplication;
a drift region of semiconductor material adjacent said avalanche termination region, said drift region having a doping density in the range of 3×10^{15} to $3 \times 10^{16}/cm^3$, the length of said drift region being determined in accordance with a preferred operating frequency of said diode; and
means for determining the effective injection current of said diode such that the noise measure of said diode is less than 50 db.

4,060,821
FIELD CONTROLLED THYRISTOR WITH BURIED GRID

Douglas E. Houston, and Surinder Krishna, both of Ballston Lake, N.Y., assignors to General Electric Co., Schenectady, N.Y.

Filed June 21, 1976, Ser. No. 697,984
Int. Cl.² H01L 29/80
U.S. Cl. 357—22 5 Claims

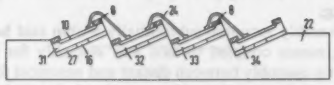


1. A field controlled thyristor comprising:
a semiconductor substrate of one type conductivity and having opposed major surfaces;
a uniform anode injecting region of opposite type conductivity in one of said major surfaces;
a current controlling grid structure comprising a plurality of surface-adjacent grid regions of opposite type conductivity in the other major surface and a like plurality of buried grid regions contacting said surface-adjacent grid regions, said surface-adjacent regions being of higher conductivity than said buried grid regions;
a plurality of surface-adjacent cathode regions of one type conductivity in said other major surface and within the interstices of said surface-adjacent grid regions, said surface-adjacent cathode regions having a larger surface area than said surface-adjacent grid regions and a higher conductivity than said substrate; and
wherein each of said buried grid regions are further characterized by having portions extending laterally under adjacent cathode regions and are spaced from the next adjacent buried grid region by a width, *b*, with each buried grid having a depth, *c*, the ratio of the depth to the width being in a range of 0.5 to 5.0 and substantially determining the magnitude of the grid-to-cathode voltage required to block substantial current flow from anode to cathode with a given anode-to-cathode voltage for a given substrate resistivity.

4,060,822
STRIP TYPE RADIATION DETECTOR AND METHOD OF MAKING SAME

Ottomar Jäntsch; Ingmar Feigt, both of Erlangen, and Wolf Rüdiger Willig, Erlangen-Bruck, all of Germany, assignors to Siemens Aktiengesellschaft, Munich, Germany

Division of Ser. No. 374,019, June 27, 1973, Pat. No. 3,939,555.
This application Feb. 24, 1976, Ser. No. 660,756
Int. Cl.² H01L 27/14
U.S. Cl. 357—30 9 Claims

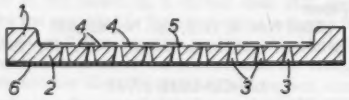


1. A detector for ionizing radiation comprising:
a. an N-conduction thin semi-conductor body having a resistivity of at least 100 ohm-cm and having two parallel flat sides;
b. a plurality of diffused P conduction electrodes on one side of said semi-conductor in the form of parallel strips;
c. an oxide layer covering the PN junctions on said one side; and
d. a plurality of parallel metal electrodes in ohmic contact with the other side of said semi-conductor at an angle to the P conduction electrodes on said one side.

4,060,823
ELECTRON-EMISSIVE SEMICONDUCTOR DEVICES

Jonathan Ross Howorth, Maldon; Alan Jerome Goss, Chelmsford, and Peter James Pool, Maldon, all of England, assignors to English Electric Valve Company Limited, England

Filed Apr. 9, 1976, Ser. No. 675,693
Claims priority, application United Kingdom, Apr. 11, 1975, 15094/75
Int. Cl.² H01L 27/14
U.S. Cl. 357—30 7 Claims



1. An electron-emissive semiconductor device comprising first and second substantially parallel surfaces which are spaced apart from one another by intervening electron-emissive semiconductor material, the first surface of which is provided with a layer or coating of a material which provides a reduction in the surface work function of the semiconductor material so that electrons are emitted from said first surface when said second surface is subjected to an incident stimulus, the semiconductor material consisting of localized elemental

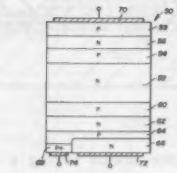
regions which are separated from each other by barrier means which extend from said first to said second surface to isolate said regions from each other and inhibit current flow between the different elemental regions.

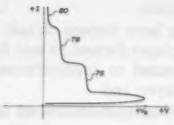
4,060,824

SLOW SPEED SEMICONDUCTOR SWITCHING DEVICE

Jearld L. Hutson, P.O. Box 34235, Dallas, Tex. 75234

Continuation-in-part of Ser. No. 488,789, July 15, 1974, abandoned. This application June 16, 1975, Ser. No. 587,536
Int. Cl.² H01L 29/00
U.S. Cl. 357—37 5 Claims





1. A slow speed asymmetrical semiconductor switching device comprising:

a body of semiconductor material having at least six layers of alternating opposite types of conductivity to form a plurality of P-N junctions,

first and second electrodes attached to exterior ones of said layers having opposite conductivity types,

a gate electrode connected to one of said layers for receiving a gating signal having either of two levels, one of the levels of said gating signal being of a predetermined low value to cause more than one regenerative switching action within said body during switching of the device from a nonconductive state to a conductive state, said regenerative switching actions occurring primarily perpendicularly to said P-N junctions and the total switching time of said body being greater than one microsecond to inhibit the generation of rf current by said device, and

the second of the levels of said gating signal being of a predetermined high value to cause said device to switch from a nonconductive state to a conductive state within an interval on the order of one microsecond.

4,060,825

HIGH SPEED HIGH POWER TWO TERMINAL SOLID STATE SWITCH FIRED BY dV/dt

Earl S. Schlegel, Plum Borough, Pa., assignor to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed Feb. 9, 1976, Ser. No. 656,497
Int. Cl.² H01L 29/74
U.S. Cl. 357—38 4 Claims

1. A two-terminal thyristor adapted to be fired by dV/dt comprising:

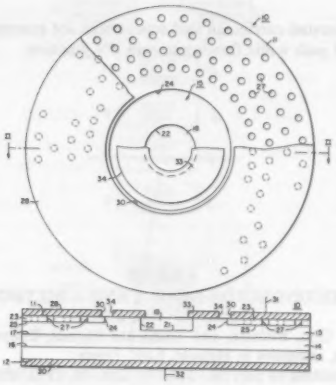
A. a body of semiconductor material having first and second outer surfaces, with at least four impurity regions of alternate type conductivity disposed through the body between the outer surfaces forming PN junctions between adjoining regions;

B. said regions being a cathode emitter region and a cathode base region adjoining parts of the first outer surface of the body, an anode base region, and an anode emitter region adjoining at least a portion of the second outer surface of the body;

C. said cathode emitter region including an auxiliary emitter region and a main emitter region, said auxiliary emitter region adjoining a portion of the first outer surface spaced centrally of the main emitter region

D. said cathode base region adjoining at least a portion of the first outer surface between the auxiliary emitter region and the main emitter region, and adjoining the first outer surface at predetermined locations bounded by the main emitter region to form cathode shunts;

E. said auxiliary emitter region being dimensioned such that $0.7 < CR\ dV/dt$ where C is the capacitance of a PN junction portion between the cathode base region and an anode base region within the confines of the outer boundary of the auxiliary emitter region, R is the effective radial



resistance in the cathode base region under the auxiliary cathode emitter region, and dV/dt is the rate of application of a triggering voltage on the anode electrode hereinafter recited;

F. a metallic electrode in ohmic contact with the first outer surface and overlying at least a portion of the auxiliary region and a portion of the cathode base region outwardly from the auxiliary region;

G. a cathode electrode in ohmic contact with the main emitter region and with the cathode base region at said cathode shunts; and

H. an anode electrode in ohmic contact with the anode emitter region.

4,060,826

LIGHT ACTIVATED THYRISTOR CAPABLE OF ACTIVATION BY INTENSITY RADIATION

Peter Voss, Munich, Germany, assignor to Siemens Aktiengesellschaft, Munich, Germany

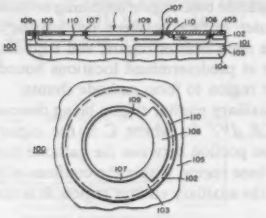
Filed Aug. 2, 1976, Ser. No. 710,972
Claims priority, application Germany, Aug. 29, 1975, 2538549
Int. Cl.² H01L 29/74
U.S. Cl. 357—38 7 Claims

1. A light activated thyristor comprising:

a. a body of a semiconductor material; said body comprising an emitter zone of a first conductivity type adjacent to a major surface of said body, a base zone of a second conductivity type adjacent to said emitter zone and sharing a portion of said major surface with said emitter zone, a PN junction interfacing said base zone and said emitter zone and intersecting said major surface between emitter and base zones, said base zone having an area at said major surface for receiving low intensity radiation, said area being a source of carriers generated by said radiation; and,

b. means for providing a low resistance path for carriers in

said source area in said base zone to said PN junction without contacting an emitter zone, such that radiation-



generated carriers in said source area are concentrated in said path while flowing to said PN junction.

4,060,827

SEMICONDUCTOR DEVICE AND A METHOD OF MAKING THE SAME

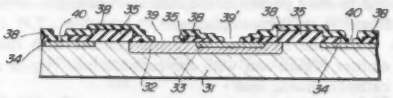
Minoru Ono, Kodaira, and Toshimitu Momoi, Tokyo, both of Japan, assignors to Hitachi, Ltd., Japan

Continuation of Ser. No. 219,470, Jan. 30, 1972, abandoned, which is a continuation of Ser. No. 701,988, Jan. 31, 1968, abandoned. This application Aug. 25, 1975, Ser. No. 607,697

Claims priority, application Japan, Feb. 3, 1967, 42-6608; Feb. 3, 1967, 42-6609

Int. Cl.² H01L *29/78, 27/02, 29/34*

U.S. Cl. 357—54 4 Claims



1. A field-effect semiconductor device comprising:

a semiconductor substrate having a major surface;

at least a pair of spaced semiconductor regions formed in said major surface of said substrate, having a conductivity type opposite to that of the adjacent semiconductor material and defining PN junctions terminating at the major surface with the adjacent semiconductor material;

an oxide film covering at least the portion of said major surface between said pair of said semiconductor regions;

an insulating film of silicon nitride which directly covers the entire exposed surface of said oxide film and the exposed surface of said major surface of the substrate to completely shield said oxide film from the surrounding atmosphere, said silicon nitride film being of substantially uniform thickness over its entire length and having further holes exposing surface portions of said semiconductor regions;

a gate electrode formed on at least a part of said insulating film covering said oxide film; and

a source and a drain electrode respectively formed on said exposed surface portions of said semiconductor regions in spaced relationship to said oxide film through said silicon nitride film.

4,060,828

SEMICONDUCTOR DEVICE HAVING MULTI-LAYER WIRING STRUCTURE WITH ADDITIONAL THROUGH-HOLE INTERCONNECTION

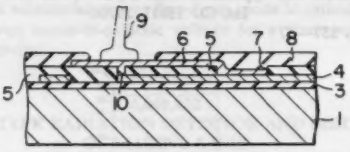
Koichiro Satonaka, Fuchu, Japan, assignor to Hitachi, Ltd., Japan

Filed Aug. 3, 1976, Ser. No. 711,301

Claims priority, application Japan, Aug. 22, 1975, 50-101245

Int. Cl.² H01L *23/48, 29/46, 29/54*

U.S. Cl. 357—71 4 Claims



1. A semiconductor device having a multi-layer wiring structure, comprising:

a. a first wiring layer formed on one main surface of a semiconductor substrate;

b. a first insulating layer formed on said first wiring layer;

c. a second wiring layer formed on said first insulating layer;

d. metal leads bonded to predetermined portions of said second wiring layer; and

e. a second insulating layer formed on the entire surface of said second wiring layer except said predetermined portions of said second wiring layer,

said first wiring layer being electrically connected with said second wiring layer through first through-holes cut in those portions of said first insulating layer which are just beneath said predetermined portions of said second wiring layer.

4,060,829

METHOD OF COLOR CORRECTION

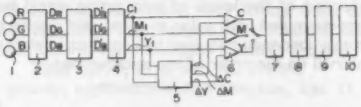
Takashi Sakamoto, Kyoto, Japan, assignor to Dainippon Screen Seizo Kabushiki-Kaisha, Kijamachi, Japan

Filed Aug. 16, 1976, Ser. No. 714,687

Claims priority, application Japan, Aug. 20, 1975, 50-100114

Int. Cl.² G03F *3/08*

U.S. Cl. 358—80 2 Claims



1. A method of color correction of the particular application to a color scanner which is adapted to produce color separation negatives of each color by utilizing color separation density signals obtained from the photoelectrical scanning of a color original and includes a color correction circuit, an analog-digital converter and a memory, said method of color correction comprising the steps of:

storing in said memory correction signals each adapted to correct a difference between a signal value digitally converted from each of said color separation density signals and a signal value corresponding to a color separation density which a finished print should have;

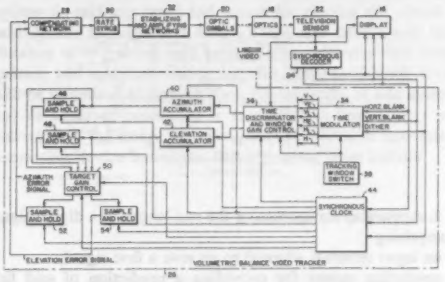
utilizing said color separation density signals, which have already been compressed to a color range reproducible by printing inks at said color correction circuit and converted to digital signals by said analog-digital converter, as addressing signals for reading out said correction signals from said memory; and

adding said read-out correction signals to said digital color separation density signals, thereby obtaining recording signals adapted to produce color separation negatives of each color.

4,060,830
VOLUMETRIC BALANCE VIDEO TRACKER

Martin G. Woolfson, Baltimore, Md., assignor to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed Oct. 22, 1976, Ser. No. 734,928
Int. Cl.[2] H04N 7/18
U.S. Cl. 358—126 15 Claims



1. A video tracker for controlling the scanning of a sensor that provides video signals corresponding to its field-of-view, said tracker comprising:

a time modulator for providing early and late gate signals that define a tracking window within the field-of-view of said sensor;

a time discriminator that is responsive to the early and late gate signals for partially integrating the video signals that occur within the tracking windows defined by the early and late gate signals to generate partial tracking error signals; and

an accumulator that is responsive to said partial tracking error signals for adding the partial tracking error signals of the time discriminator to provide tracking error signals.

4,060,831
WIDEBAND ELECTROMECHANICAL RECORDING SYSTEM

Jerome Barth Halter, Indianapolis, Ind., assignor to RCA Corporation, New York, N.Y.

Filed Oct. 12, 1976, Ser. No. 731,204
Int. Cl.[2] H04N 5/76; G11B 3/00
U.S. Cl. 358—128 8 Claims

1. A system for electromechanically recording signals in a disc master; the frequency spectrum of said signals having a region of relatively high energy level; said system comprising:

A. a source for supplying said signals;

B. a cutterhead responsive to said signals for recording said signals in said disc master, when relative motion is established therebetween;

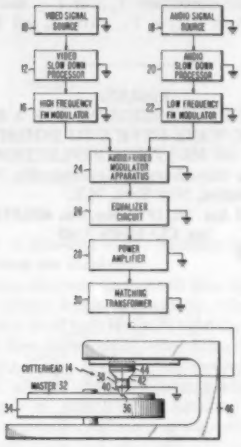
the frequency response characteristic of said cutterhead having a region of relatively increased sensitivity surrounding the resonant frequency of said cutterhead;

C. means for applying said signals to said cutterhead to cause said cutterhead to undergo vibrations in representation of said signals; and

D. means interposed between said signal source and said signal applying means for selectively modifying the energy level of said signals;

said energy level modifying means being constructed such that the shape of the frequency response characteristic of said energy level modifying means complements the shape of the frequency response characteristic of said cutterhead in said region of relatively increased sensitivity, so that the combined response of said energy level modifying means and said cutterhead is relatively uniform over said signal frequency spectrum;

said cutterhead being constructed such that the response of said cutterhead to said signal component frequencies in said region of relatively increased sensitivity varies with frequency in a manner substantially corresponding to the manner in which the energy level of said signal components varies over said region of relatively high energy level of said signal frequency spectrum; and

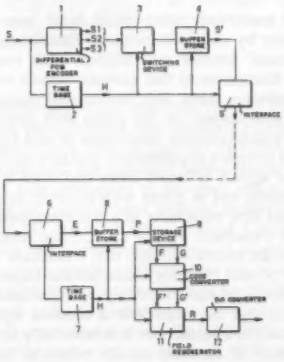


said energy level modifying means having a response characteristic that varies in a manner which is substantially the inverse of the manner in which the energy levels of said signal components vary over said region of relatively high energy level so as to substantially reduce the energy level of said high energy level signal components prior to their application to said cutterhead.

4,060,832
DIGIT RATE REDUCING METHOD IN VIDEO SIGNAL TRANSMISSION

Daniel Pierre Yvon Devimeux, and François-Xavier Antoine Stouls, both of Perros Guirec, France, assignors to Societe Anonyme de Telecommunications, France

Filed June 23, 1976, Ser. No. 698,833
Claims priority, application France, July 3, 1975, 75.20864
Int. Cl.[2] H04N 7/12
U.S. Cl. 358—133 4 Claims



1. A digit rate reducing method in the transmission of video-

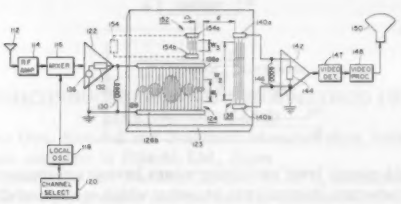
telephone signals, wherein each frame is scanned by means of two consecutive fields comprising each the lines of same parity, each frame dot being represented by a word of n, in particular 3, binary digits comprising transmitting a frame every three frames, storing a frame of each parity at the receiving equipment in a frame storage device, systematicaly freshening-up a stored frame by the next transmitted frame of same parity, and regenerating intermediate frames by interpolating between the stored frames, further comprising forming a pseudo-field I_n with opposite parity to a stored field T_n by interpolating between T_n and the stored field T_{n+3} or T_{-3}, and regenerating an intermediate field T_{n+1} or T_{n-1} from I_n and T_{n+3} or T_{n-3}, respectively.

4,060,833

TRANSDUCER ARRANGEMENT FOR A SURFACE ACOUSTIC WAVE DEVICE TO INHIBIT THE GENERATION OF MULTIPLE REFLECTION SIGNALS

Lubomyr Stephen Onyshkevych, Lawrenceville, N.J., assignor to RCA Corporation, New York, N.Y.

Filed Apr. 26, 1976, Ser. No. 680,073
Int. Cl.² H04N 5/48
U.S. Cl. 358—188 **11 Claims**



1. Apparatus comprising:

a piezoelectric substrate capable of supporting acoustic signals;

first, second and third transducers associated with one surface of said substrate, each of said transducers including at least one pair of interdigitized comb-shaped conductors, each of said transducers having a complex characteristic impedance associated therewith;

first and second electrical circuits respectively connected between said comb-shaped conductors of said first and second transducers, each of said circuits having a complex impedance associated therewith;

said first and second transducers being space apart a predetermined distance and aligned with respect to one another so that acoustic signals may be propagated between them;

said third transducer having no electrical connections thereto;

said third transducer being space apart from said second transducer by said predetermined distance modified by an incremental distance and aligned with respect to said second transducer so that acoustic signals may be propagated between them, said incremental distance being selected with respect to the phase shift provided by said complex characteristic impedance of said first transducer and said complex impedance of said first circuit so that the acoustic signals reflected from said third transducer are substantially out of phase with acoustic signals reflected from said first transducer at a predetermined frequency;

said third transducer having an aperture selected with respect to the aperture of said first transducer and the magnitudes of said complex characteristic impedance of said first transducer and said complex impedance of said first circuit so that the magnitude of acoustic signals reflected from said third transducer is substantially the same as the magnitude of acoustic signals reflected from said first transducer at said predetermined frequency; and

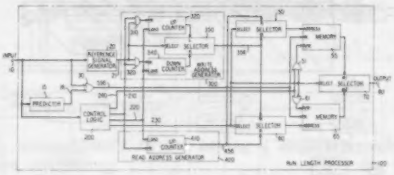
said second transducer receiving and substantially cancelling reflected acoustic waves from said first transducer and said third transducer.

4,060,834

PROCESSOR FOR INCREASING THE RUN-LENGTH OF DIGITAL SIGNALS

Frank William Mounts, Colts Neck, and Arun Narayan Netravali, Matawan, both of N.J., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Oct. 21, 1976, Ser. No. 734,384
Int. Cl.² H04N 1/00
U.S. Cl. 358—261 **6 Claims**



1. Apparatus for increasing the run-length of a digital signal comprising

an input terminal adapted to receive a first signal,

predicting means for providing a prediction of said first signal,

means responsive to said predicting means for supplying a reference signal,

means for comparing said first signal and said prediction to obtain a signal measure,

means responsive to said response signal for permuting said signal measure, and

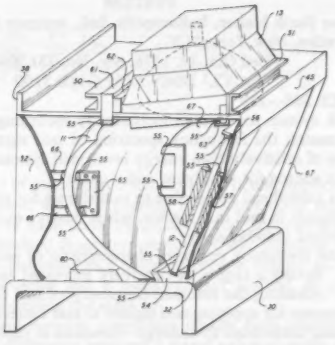
means for extending said permuted signal measure to an output terminal.

4,060,835

VIEWING HEAD

David Paul Gdovin, Vestal, N.Y., assignor to The Singer Company, Binghamton, N.Y.

Filed Feb. 2, 1976, Ser. No. 654,106
Int. Cl.² H04N 5/74, 5/645
U.S. Cl. 358—238 **10 Claims**



1. An improved display system and viewing head of the type which has a spherical mirror of radius r, a beamsplitter positioned between an observer and the center of said spherical mirror at approximately a 45° angle and an image projecting device located at a distance $r/2$ above said beamsplitter contained in a machined housing wherein the improvement comprises: a premachined base to accept a portion of said spherical mirror and said beamsplitter; means for mounting said spherical mirror to a predetermined location on said base; means for

fastening said beamsplitter to a predetermined location on said base so that said beamsplitter will be positioned at approximately a 45° angle from the center of said spherical mirror; a first premachined side panel which is connected to said base; a second premachined side panel which is connected to said base; means for connecting the side edges of said spherical mirror to said first and second side panels; means for holding at predetermined locations the edges of said beamsplitter against said first and second panels; a premachined top panel having a hole, said top panel being able to accept a portion of said spherical mirror and said beamsplitter while being connected to said first and second side panels; means for attaching at predetermined locations said spherical mirror and said beamsplitter to said top panel and means for placing the screen of said device through said hole so that said device will be a distance of $r/2$ above said beamsplitter, whereby said beamsplitter, said spherical mirror and said image projecting device will be in optical alignment upon the assembly of said system, and an observer positioned in front of said beamsplitter will believe that the image appearing on the screen of said image projecting device is realistic and is coming from infinity.

4,060,836

TELEVISION DEFLECTION COIL UNIT

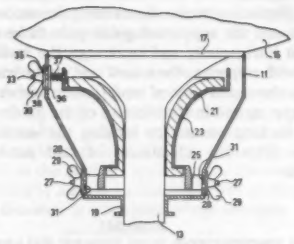
Peter H. J. Corbeij, and Tjitte Talsma, both of Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Filed July 7, 1976, Ser. No. 703,220

Claims priority, application Netherlands, July 18, 1975, 7508613

Int. Cl.² H04N *3/16;* H01F *27/06*

U.S. Cl. 358—248 3 Claims



1. A deflection coil unit for a television display tube, said unit comprising a housing, a flared deflection yoke which is located within said housing, which housing is adapted to be secured to a display tube when the unit is mounted thereon, said yoke being capable of being displaced along its longitudinal axis which is adapted to substantially coincide with the longitudinal axis of a display tube, a ball joint means for mounting said yoke at its narrow end comprising first and second members each having a part spherical surface which cooperate to allow pivotal movement of said yoke about a plurality of axes, said first member being secured to said yoke, said second member being capable of being secured to said housing, and separate adjusting means for independently tilting said yoke about two mutually perpendicular transverse axes which extend perpendicular to the longitudinal axis of said yoke and which are situated at or adjacent the said narrow end of said yoke.

4,060,837

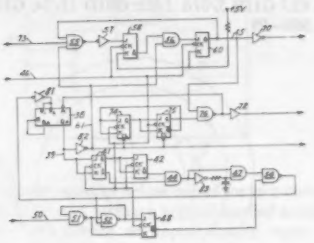
VARIABLE CELL WIDTH RECORDING

John L. Rynearson, Oakdale, Minn., assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed Apr. 26, 1976, Ser. No. 680,055

Int. Cl.² G11B *5/02*

U.S. Cl. 360—44 15 Claims



1. Method of encoding binary numbers on a recording medium comprising the steps of:

1. generating alternate timing and data signals of first and second voltage levels, respectively, wherein each timing signal has a fixed time duration t and the data signals have variable time durations x, a first binary number is designated by $x = at$, a second binary number is designated by $x = abt$, and the absence of binary information is designated by $x > abct$, where a is a predetermined small number and each of b and c is a predetermined number appreciably exceeding one, and
2. serially recording the alternate timing and data signals along a track of the medium.

4,060,838

CENTERING PIN FOR CASSETTE APPARATUS

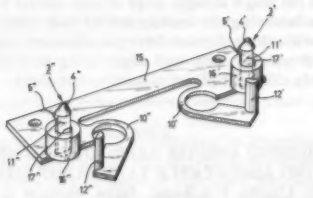
Jos Louis Hubert Meermans, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Mar. 1, 1976, Ser. No. 662,454

Claims priority, application Netherlands, Mar. 14, 1975, 7503047

Int. Cl.² B65H *75/02*

U.S. Cl. 360—96 5 Claims



1. In a cassette-recording apparatus for use with a cassette having at least one centering opening having a centering edge and comprising a deck plate; at least one cassette-centering pin having a longitudinal axis disposed perpendicular to the plate, and having a base connected to the plate and a tip having a locally thickened portion; and resilient means for urging a portion of the pin and a centering edge of a cassette into engagement with one another, the improved centering pin consisting of a unitary molding wherein the pin is longitudinally split along at least part of its length such that the pin comprises a first part and a second part separated from each other by a longitudinal slit extending through the base of the pin, said first part being rigidly connected to said deck plate; and said resilient means comprises a resilient connection of the second part to the deck plate for pivotally urging said second part away

from said first part about an axis remote from and parallel to said longitudinal axis.

4,060,839

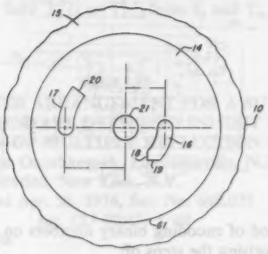
FLEXIBLE INFORMATION STORAGE DISC

Robert Alan Meadows, Richardson, Tex., assignor to Texas Instruments Incorporated, Dallas, Tex.

Filed Jan. 7, 1976, Ser. No. 647,024

Int. Cl.[2] G11B *5/016, 5/82;* G01D *15/24;* G11B *3/60*

U.S. Cl. 360—99 **16 Claims**



1. A flexible information storage media comprising:

a sheet of flexible material including a central mounting portion extending radially outwardly from the approximate geometric center of said sheet,

and an outer body portion integral with the central mounting portion and concentric therewith, said outer body portion providing a surface area on which information may be recorded,

said central mounting portion being provided with at least first and second drive pin-receiving apertures disposed radially outwardly with respect to the approximate geometric center of said sheet and on opposite sides thereof,

said first and second apertures being respectively arcuately elongated in directions conforming to rotation of said sheet about its geometric center,

the leading end of said first arcuately elongated aperture being defined by a pair of straight edges angularly intersecting at an apex,

the leading end of said second arcuately elongated aperture being defined by a single straight edge,

the pair of intersecting straight edges of said central mounting portion bounding the leading end of said first aperture and the single straight edge of said central mounting portion bounding the leading end of said second aperture to provide three distinct drive pin abutment edges for a pair of drive pins with said edges being arranged in respectively different planes normal to the sheet.

4,060,840

RECORDING AND/OR REPRODUCING APPARATUS HAVING ADJUSTABLE TAPE GUIDE MECHANISM

Hiroyuki Umeda, Yokohama, Japan, assignor to Victor Company of Japan, Limited, Yokohama, Japan

Filed June 22, 1976, Ser. No. 698,497

Claims priority, application Japan, June 23, 1975, 50-84987[U]

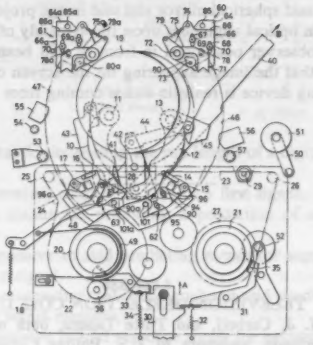
Int. Cl.[2] G11B *15/60, 15/66*

U.S. Cl. 360—130 **7 Claims**

1. In a recording and/or reproducing apparatus having a horizontal base plate, a guide drum including at least one head mounted to rotate in a plane within said drum, the cylindrical surface of said drum being inclined with respect to said base plate, recording tape disposed about a tape supply reel, the guide drum and a tape take-up reel in such a way that said tape defines a portion of a cylinder about said guide drum and the longitudinal center of said tape is disposed on substantially a single horizontal plane, and tape guide means for guiding the tape along a predetermined tape path, said tape guide means including a pair of height position guide means disposed respectively on the tape inlet side and on the tape outlet side of the cylindrical surface of said guide drum, a pair of guide poles disposed respectively between said height position guide means and said guide drum, each of said height position guide means having a pair of flanges for guiding the edges of said tape, each of said guide poles being inclined with respect to said base plate to convert between rectilinear and helical movements of said tape, the improvement in said tape guide means comprising:

first means for supporting one of said height position guide means;

first displacing means for causing the first support means and the supported height position guide means to be displaced horizontally and to change the distance between the guide drum and said one of the height position guide means, to



thereby adjust the height position of the tape on the guide drum;

first locking means for locking the first support means after the adjustment of said first displacing means;

a second means for supporting one of said guide poles between the guide drum and said one of the height position guide means;

second displacing means for causing the second supporting means and the supported guide pole to be rotatably displaced horizontally and to change the inclination of the pole with respect to the axis of said guide drum, to thereby adjust the uniformity of tape tension across the width of the tape on and in the vicinity of the guide drum; and

second locking means for locking the second supporting means after the adjustment of said second displacing means.

4,060,841

MOTOR PROTECTOR FOR THREE-PHASE MOTORS

Ernest Duane Allen, Box 426, Hudson, Colo. 80642

Filed Apr. 19, 1976, Ser. No. 678,398

Int. Cl.[2] H02H *7/09*

U.S. Cl. 361—33 **6 Claims**

1. A motor protector for a three-phase electric motor supplied electric power from a three-phase electric power supply through a motor control circuit, said motor protector comprising:

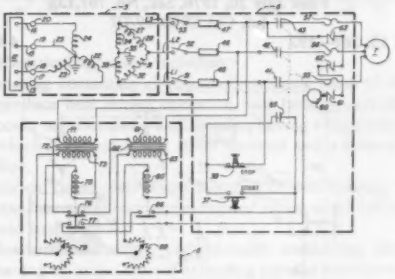
a first sensing step-down transformer having a first primary winding energized by the voltage across a first phase of said power supply and having a first secondary winding in which a first secondary voltage is induced from said first primary winding;

a first relay having a first AC coil in a first series circuit with a first variable resistor and said first secondary winding and having a first set of contacts and a second set of contacts;

a second sensing step-down transformer having a second

primary winding energized by the voltage across a second phase of said power supply through said first set of contacts and having a second secondary winding in which a second secondary voltage is induced from said second primary winding; and

a second relay having a second AC coil in a second series circuit with a second variable resistor and said second secondary winding electrically independent of said first series circuit and having a third set of contacts, said second and third sets of contacts arranged for controlling the power to said motor control circuit so that when there is a failure in the power supply that reduces the electric voltage across said first phase below a predetermined amount the electric power is disconnected from said second primary winding and removed from said motor and when there is a failure in the power supply that reduces the electric voltage across said second phase below a predetermined amount the electric power is removed from said motor,



each of said first and second AC coils having a threshold voltage a selected amount of voltage less than the normal sensed voltage in the associated secondary winding above which the power is maintained and below which the electric power is removed from said electric motor,

each said variable resistor having a maximum relay coil voltage setting, a threshold relay coil voltage setting and a range of intermediate relay coil voltage settings between said threshold and maximum settings, the maximum relay coil voltage setting requiring the greatest amount of sensed phase voltage decrease to actuate the associated relay with less sensed phase voltage decrease necessary as the associated relay coil voltage settings approach the threshold voltage setting so that a lesser reduction in sensed phase voltage is required to actuate the associated relay coil as the settings approach the threshold voltage setting, thereby increasing the sensitivity of the associated relay to decrease in associated phase voltages.

4,060,842

COMBINED MUTUAL DRAINAGE REACTOR AND GROUNDING RELAY

Gordon Y. R. Allen, 4 Ireland Court, Islington, Ontario, Canada

Filed Feb. 24, 1976, Ser. No. 661,005

Int. Cl.[2] H02H *3/22*

U.S. Cl. 361—56 **8 Claims**

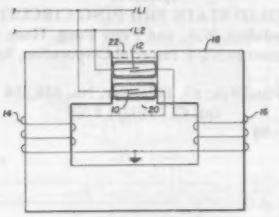
1. A combined mutual drainage reactor and grounding relay for overvoltage protection of a two-wire communication system, which comprises:

a magnetic core, at least a portion of which includes a uniform air gap;

a pair of coils inductively coupled by the magnetic core, each having the same number of turns; and

a pair of magnetically-operated, normally open, single-pole, single-throw, gas-filled reed switches, each having approximately the same voltage breakdown characteristics between its open contacts, and each switch requiring approximately the same minimum magnetic field strength for closure, both switches being disposed in said air gap of said magnetic core,

wherein each coil is connected in series with a corresponding one of said switches across one of the two communication lines to ground, so that a voltage applied across one of said coils will induce an approximately equal voltage across the other of said coils.



4,060,843

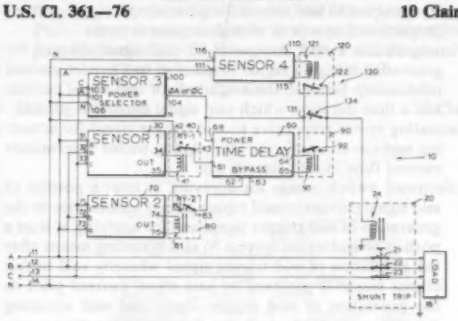
PROTECTION CIRCUIT FOR MULTIPLE PHASE POWER SYSTEMS

Charles H. Bost, Rte. 3, Box 43-A, Winter Haven, Fla. 33880

Continuation-in-part of Ser. No. 516,464, Oct. 21, 1974, abandoned. This application Mar. 25, 1976, Ser. No. 670,121

Int. Cl.[2] H02H *3/24*

U.S. Cl. 361—76 **10 Claims**



1. A protection circuit for use with circuit breaker means for electrical apparatus operated by multiple phase, alternating current power systems characterized by a plurality of electrical distribution lines for transmitting electrical energy, the electrical energy in said lines having a spaced phase relationship, wherein said protection circuit comprises:

first sensing means coupled to said lines for generating a first signal responsive to detecting an undesirable phase imbalance between two or more of said lines, and detecting a low voltage on one of said lines, and detecting a low voltage on more than one of said lines;

second sensing means coupled to said lines for detecting a phase reversal between two or more of said lines, said second sensing means initiating a second signal responsive thereto;

circuit breaker operating means coupled to said second sensing means for operating said circuit breaker means responsive to said second signal;

time delay means operably coupled between said first sensing means and said circuit breaker operating means, said time delay means for initiating said second signal responsive to said first signal being received for a predetermined period of time; and

power selector means coupled to at least two of said lines for supplying a power output from a priority one of said lines to said circuit breaker operating means, with said power

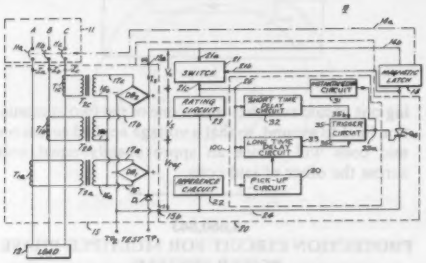
selector means selecting another one of said lines responsive to a loss of power on said priority line.

4,060,844

SOLID STATE TRIPPING CIRCUIT

Lee Davis, Audubon, N.J., and Peter Pang, Hong Kong, Hong Kong, assignors to I-T-E Imperial Corporation, Spring House, Pa.

Filed Feb. 17, 1976, Ser. No. 658,354
Int. Cl.² H02H 3/08
U.S. Cl. 361—96 **12 Claims**



1. Apparatus for interrupting a current flowing in a circuit having a normal rated current, comprising:

means for interrupting the continuity of said circuit;

means coupled to said circuit for generating a signal current proportional to a peak of said circuit current;

timing circuit means responsive to said signal current for generating a trigger signal responsive to a predetermined relationship between the magnitude of said signal current and a time duration which said signal current is present;

actuating means responsive to said trigger signal for actuating said circuit continuity interrupting means to terminate current flow in said circuit; and

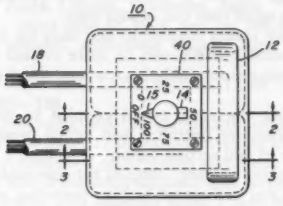
electronic switch means for applying at least a portion of said signal current to said timing circuit means prior to the generation of said trigger signal and for applying at least a portion of said signal current to said actuating means after the generation of said trigger signal whereby said timing circuit means is powered by said signal current prior to the generation of said trigger signal and said actuating means is powered by said signal current after the generation of said trigger signal.

4,060,845

PORTABLE DEMAGNETIZER

Paul E. Bowers, Marengo, and Mukund A. Phadke, Crystal Lake, both of Ill., assignors to The Arnold Engineering Company, Marengo, Ill.

Filed Mar. 25, 1976, Ser. No. 670,288
Int. Cl.² H01F 13/00
U.S. Cl. 361—149 **10 Claims**



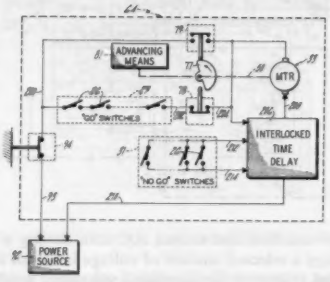
1. A portable demagnetizer comprising a housing, a demagnetizing head in said housing including at least one coil, means for supplying an alternating current potential to said coil, means for varying the magnitude of said alternating current potential from a maximum of the supplied potential to a predetermined minimum whereby to reduce the magnitude of the voltage potential applied to said demagnetization head and thereby reduce the magnitude of the magnetic field of said demagnetization head, and a control circuit for operating said varying means to apply a step-less alternating current power to aid demagnetization head for each variation of said varying means, said control circuit including a power control cord leading to said housing and means supported by said housing for operating said control circuit.

4,060,846

HIGH SECURITY LOCK

Michael L. Conn, San Jose, Calif., assignor to United Technologies Corporation, Hartford, Conn.

Filed July 20, 1976, Ser. No. 707,133
Int. Cl.² E05B 49/02
U.S. Cl. 361—193 **4 Claims**



1. An improved electromagnetic locking apparatus of the type which includes a lock portion and a removable key portion, the key portion providing a determined unlocking combination signal, the lock portion having an electromotive device for providing a desired unlocking function in response to an unlock voltage signal presented through a switch contact arrangement provided by selective activation of a plurality of switches in response to the placement of the key portion on a determined surface location of the lock portion coincident with presentation of the determined unlocking combination signal, the plurality of switches including at least one switch for providing a signal manifestation in response to the proximate placement of the key portion within the determined surface location of the lock portion, wherein the improvement comprises:

time delay means, responsive to the unlock voltage signal and to the signal manifestation, for providing, at the end of a determined time interval following presentation of the unlock voltage signal, a gate signal in response to the simultaneous presence of the unlock voltage signal and the signal manifestation during the determined time interval; and

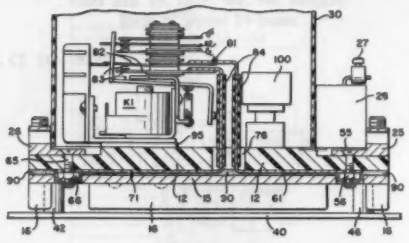
switch means, interconnected between the switch contact arrangement provided by the plurality of switches and the electromotive device, and selectively operable in a first state or a second state in response to the presence or absence of the gate signal from said timing means, said switch means presenting the unlock voltage signal to the electromotive device when operated in the first state in response to the presence of a gate signal, said switch means not presenting the unlock voltage signal to the electromotive device when operated in a second state in response to the absence of a gate signal.

4,060,847

COOLING ARRANGEMENT FOR ELECTRICAL POWER CONTACTOR

John K. Penrod, Bellbrook, Ohio, assignor to Power Management Corporation, Dayton, Ohio

Filed Mar. 11, 1976, Ser. No. 666,164
Int. Cl.[2] H05K 7/20
U.S. Cl. 361—387 4 Claims



1. Electrical apparatus including

a housing containing electrical components some of which produce heat during operation, said housing including a cover member and a base member having a top surface on which is mounted said cover member and a bottom surface;

electrical connection means mounted on said housing,

means forming at least one elongated recess in the bottom of said base member;

at least one electrically and thermally conducting element having a portion thereof extending into the interior of said housing where it is in electrical and thermal contact with said electrical components and another portion thereof extending from said housing through said recess to said electrical connection means; and

thermally conductive but electrically insulative means filling said recess between said element and the bottom surface of said base member whereby the bottom surface of said base member may be placed in contact with heat sink means and the heat carried by said element dissipated into said heat sink means without electrical contact therewith.

4,060,848

ELECTRONIC CALCULATOR SYSTEM HAVING AUDIO MESSAGES FOR OPERATOR INTERACTION

Gilbert Peter Hyatt, P.O. Box 4584, Anaheim, Calif. 92803

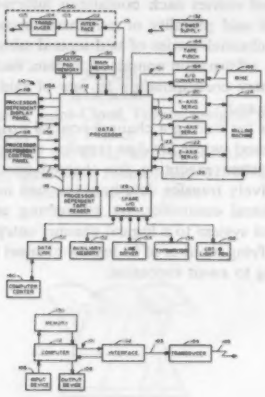
Continuation-in-part of Ser. No. 101,881, Dec. 28, 1970. This application Jan. 22, 1973, Ser. No. 325,941
Int. Cl.[2] G06F 3/16
U.S. Cl. 364—200 4 Claims

1. A data processing system comprising:

operator actuable input means for generating at least one input signal;

stored program computer means for processing digital speech information under control of a stored program in response to the input signal; said computer means comprising memory means for storing digital information; said memory means comprising a first memory portion for storing the program wherein said stored program includes a plurality of computer instructions and said memory means further comprising a second memory portion for storing the digital speech information; and said computer means further comprising means for generating at least one output signal related to a speech message in response to the processing of the stored digital speech information; and

speech means for generating a speech message in response to the output signal; said speech means comprising signal conditioning means for generating a conditioned signal in response to the output signal and sound transducer means



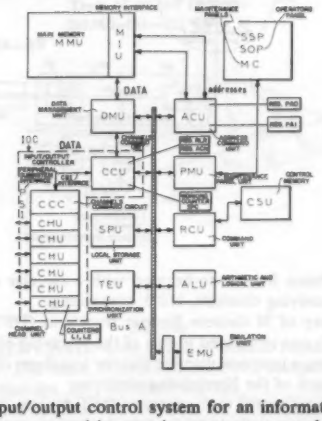
for generating the speech message in response to the conditioned signal.

4,060,849

DATA INPUT AND OUTPUT CONTROLLER

Jacques Michel Jean Bienvenu, Paris; Jean-Claude Marcel Cassonnet, Conflans-Ste-Honorine, and Marc Michel Appell, Paris, all of France, assignors to Compagnie Internationale pour l'Informatique Cii-Honeywell Bull, Paris, France

Filed Oct. 28, 1975, Ser. No. 626,220
Int. Cl.[2] G06F 3/00
U.S. Cl. 364—200 7 Claims



1. An input/output control system for an information processing system, comprising a main memory, a central processing unit having an input, a peripheral controller, and a plurality of peripheral units, each coupled to said central processing unit by said peripheral controller, said input/output control system comprising:

a. a plurality of physical channels disposed between said peripheral controller and said input to said central processing unit;

b. a plurality of logical channels for communicating information with said central processing unit, each of said logical channels being uniquely associated with one of said peripheral units and identified uniquely by a channel number;

c. said main memory comprising means for storing a first table including a number of physical channel entries con-

taining in formation relative to said plurality of physical channels and a second table including a number of logical channel entries each containing information relative to one of said plurality of peripheral units, the number of logic channel entries of said second table enabling access to the information contained therein, each physical channel entry corresponding to one of said logical channel tables; and

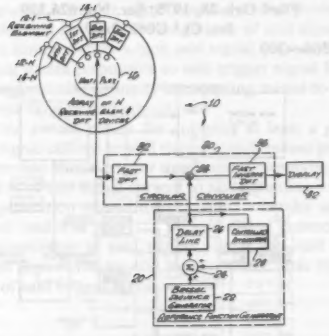
d. means for storing a channel control program comprising command words for data transfer, said input/output control system executing the channel control programs to selectively transfer data between said main memory and peripheral controller, by connecting said input/output control system to a logical channel entry and placing the identifying number of its logical channel in said means for storing to await execution.

4,060,850

BEAM FORMER USING BESSEL SEQUENCES

Jeffrey M. Speiser, San Diego, Calif., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Apr. 25, 1977, Ser. No. 791,132
Int. Cl.² G06G 7/19; G06F 15/34
U.S. Cl. 364—819 **12 Claims**



1. A beam former, to be used with a circular array of N signal receiving elements, $N \geqq 3$, comprising:

an array of N discrete Fourier transform (DFT) devices, each one connected to one of the receiving elements, for taking a temporal discrete Fourier transform of the signals at each of the N receiving elements;

means connected to the array of DFT devices, for connecting sequentially to each of the N devices;

a reference function generator, which generates the sequence of terms

$$G_n = \sum_{p=-M}^{M} J_{n+pN}(x), \quad n = 0, 1, \ldots, N-1,$$

where the argument x is equal to the number of wavelengths in the circumference of the circular array at the frequency being processed; and

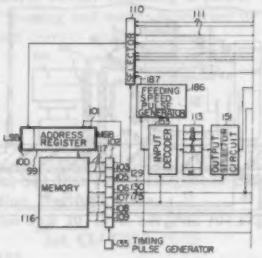
means connected to the connecting means and to the reference function generator, for circularly convolving the signals received from the connecting means and the function generator.

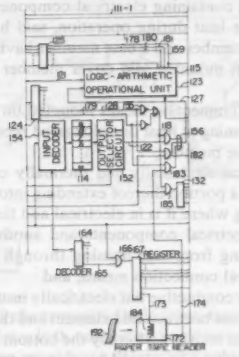
4,060,851

CONTROL SYSTEM OF A NUMERICAL CONTROL UNIT

Kazuo Nakatsukasa; Kazuo Murata; Tetsuo Ohkubo; Masayoshi Yurugi, and Shinobu Takahashi, all of Tokyo, Japan, assignors to Oki Electric Industry Co., Ltd., Tokyo, Japan

Filed July 10, 1975, Ser. No. 594,737
Claims priority, application Japan, July 15, 1974, 49-80238
Int. Cl.² G06F 9/20, 15/46
U.S. Cl. 364—900 **3 Claims**





1. A control system of a numerical control unit for use in controlling a machine tool having a plurality of control switches associated thererwith, said control system comprising:

a digital memory for storing a control instructions program;

means for reading out for execution control instructions of said control instructions program, from said digital memory;

a plurality of memory registers responsive to said means for reading out for storing a plurality of said control instructions;

a plurality of register groups for storing sets of data for numerical control;

at least one selector circuit connected between particular memory registers and a particular register group for selectively transferring data to a said particular register group;

a logic arithmetic operational unit for selectively receiving data from particular portions of said register groups and for carrying out arithmetic operation in accordance with instructions in the memory registers;

servo mechanism means connected to the output of said logic arithmetic operational circuit and memory registers for controlling said machine tool in accordance with instructions in the memory registers;

an address register for providing address information to said memory;

and a selector means responsive to said arithmetic operational unit and being further responsive to the condition of signals and switches in said machine tool for determining in combination with the information stored in a particular one of said memory registers, the address of the control instructions to be next executed.

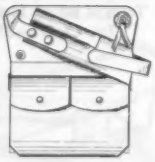
V964/5 NO29 77 UMI

DESIGNS

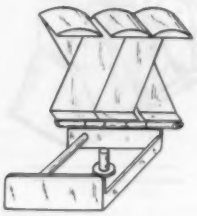
NOVEMBER 29, 1977

246,486
FLUID FILLED INSOLE FOR FOOTWEAR
John Wesley Nickel, 18201 Impala Drive, Tustin, Calif. 92680
Filed Jan. 28, 1976, Ser. No. 653,221
Term of patent 14 years
Int. Cl. D2—*04*
U.S. Cl. D2—318

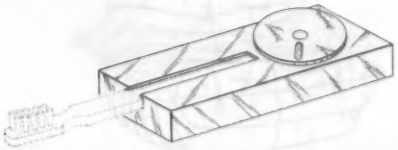
246,487
BELT PACK FOR A VETERINARIAN OR THE LIKE
Robert Waters, R.R. 1, New Albin, Iowa 52160
Filed Mar. 8, 1976, Ser. No. 664,701
Term of patent 14 years
Int. Cl. D2—*07*
U.S. Cl. D2—400



246,488
BUCKLE
Jacques Zimmerman, Saint-Cloud, France, assignor to Les Must de Cartier-France, Paris, France
Filed Feb. 20, 1976, Ser. No. 659,635
Claims priority, application France, Aug. 22, 1975, 74.130
Term of patent 14 years
Int. Cl. D2—*07*
U.S. Cl. D2—427

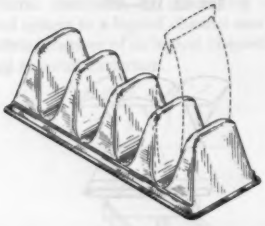


246,489
COMBINED TOOTHBRUSH HOLDER AND PILL DISPENSER
David Lynn Cunningham, 7502 W. 10th Ave., Apt. 2, Lakewood, Colo. 80215
Filed Dec. 4, 1975, Ser. No. 637,870
Term of patent 14 years
Int. Cl. D4—*02;* D9—*03*
U.S. Cl. D4—18



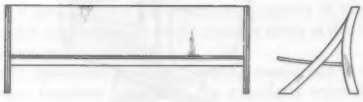
246,490
COMBINED CHAIR AND COLLAPSIBLE TABLE UNIT
Clement P. DuFresne, Winston-Salem, N.C., assignor to Fairchild Industries, Inc., Germantown, Md.
Filed Aug. 15, 1975, Ser. No. 605,017
Term of patent 14 years
Int. Cl. D6—*05*
U.S. Cl. D6—31

246,491
TRAY FOR DISPLAY AND STORAGE OF FLEXIBLE BAGS
Herbert Fred D'Alo, Oakwood Hills-Cary, Ill., assignor to Abbott Laboratories, North Chicago, Ill.
Filed Jan. 12, 1976, Ser. No. 648,062
Term of patent 14 years
Int. Cl. D6—*04;* D20—*02*
U.S. Cl. D6—188



246,492
SEAT
Pierre Roset, Montagnieu, France, assignor to Roset S.A., Briord, France
Filed Aug. 6, 1976, Ser. No. 712,292
Term of patent 14 years
Int. Cl. D6—*01*
U.S. Cl. D6—37

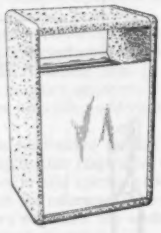
246,493
COUCH FRAME
Werner Blaser, Bottmingen, Switzerland, assignor to Dasu Anstalt, Vaduz, Liechtenstein
Filed Mar. 21, 1975, Ser. No. 560,633
Claims priority, application Hague, Sept. 25, 1974, 59491/70
Term of patent 14 years
Int. Cl. D6—*06*
U.S. Cl. D6—191



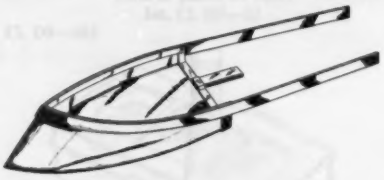
246,494
CUP OR SIMILAR ARTICLE
George B. Jensen, Syracuse, N.Y., assignor to Syracuse China Corporation, Syracuse, N.Y.
Filed June 25, 1975, Ser. No. 590,142
Term of patent 14 years
Int. Cl. D7—*01*
U.S. Cl. D7—9

246,495
COOKIE CUTTER
Paula J. Montano, 56 Clark St., New Haven, Conn. 06511
Filed Mar. 26, 1976, Ser. No. 670,884
Term of patent 14 years
Int. Cl. D7—*04*
U.S. Cl. D7—43

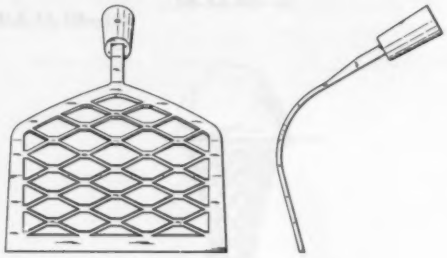
246,496
LITTER RECEPTACLE
Harald Weckwerth, 1775 NW. Mall St., Issaquah, Wash. 98027
Filed Feb. 17, 1976, Ser. No. 658,388
Term of patent 14 years
Int. Cl. D7—*05*
U.S. Cl. D7—189



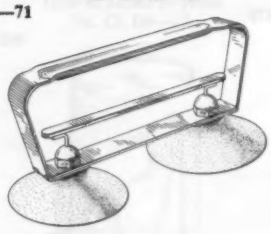
246,497
IRON COVER
Manabu Toyosawa, 2-2-4, Nakano, Nakano, Tokyo, Japan
Filed Jan. 30, 1976, Ser. No. 653,702
Term of patent 14 years
Int. Cl. D7—*05*
U.S. Cl. D7—205



246,498
BLADE FOR A MORTAR HOE
John Polc, 18 Hemlock St., Bairdford, Pa. 15006
Filed Jan. 23, 1976, Ser. No. 651,807
Term of patent 14 years
Int. Cl. D8—*01*
U.S. Cl. D8—11

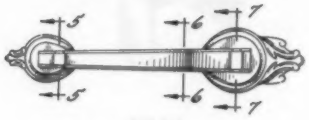


246,499
MATERIALS HANDLING DEVICE
Lance K. Poulsen; Richard D. Miller, both of Racine, Wis., and Robert D. Flinn, Highland Park, Ill., assignors to Rajo Motor & Manufacturing Company, Racine, Wis.
Filed Aug. 9, 1976, Ser. No. 712,731
Term of patent 14 years
Int. Cl. D8—*05*
U.S. Cl. D8—71



246,500
MATERIALS HANDLING DEVICE
Lance K. Poulsen; Richard D. Miller, both of Racine, Wis., and Robert D. Flinn, Highland Park, Ill., assignors to Rajo Motor & Manufacturing Company, Racine, Wis.
Filed Aug. 9, 1976, Ser. No. 712,732
Term of patent 14 years
Int. Cl. D8—*05*
U.S. Cl. D8—71

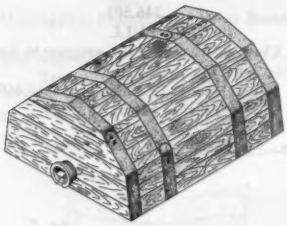
246,501
PULL
LaVerne E. Clayton, Rockford, Ill., assignor to Amerock Corporation, Rockford, Ill.
Filed Dec. 1, 1976, Ser. No. 746,469
Term of patent 14 years
Int. Cl. D8—*06*
U.S. Cl. D8—320



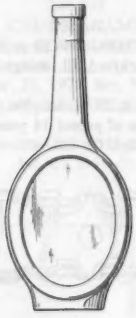
246,502
ESCUTCHEON FOR A KNOB
LaVerne E. Clayton, Rockford, Ill., assignor to Amerock Corporation, Rockford, Ill.
Filed Dec. 1, 1976, Ser. No. 746,470
Term of patent 14 years
Int. Cl. D8—*09*
U.S. Cl. D8—352

246,503
ESCUTCHEON
LaVerne E. Clayton, Rockford, Ill., assignor to Amerock Corporation, Rockford, Ill.
Filed Dec. 1, 1976, Ser. No. 746,522
Term of patent 14 years
Int. Cl. D8—*09*
U.S. Cl. D8—352

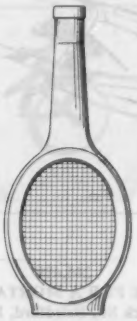
246,504
BEVERAGE CONTAINER
Gary F. Anger, 2050 Southwest Expr., San Jose, Calif. 95126, and Joseph C. Sesnak, 2309 Price Way, San Jose, Calif. 95124
Filed Mar. 22, 1976, Ser. No. 669,227
Term of patent 14 years
Int. Cl. D9—*01*
U.S. Cl. D9—28



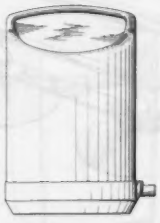
246,505
BOTTLE
John Paul Veasy, Alameda, Calif., assignor to Owens-Illinois, Inc.
Filed Dec. 18, 1975, Ser. No. 642,091
Term of patent 14 years
Int. Cl. D9—*01*
U.S. Cl. D9—137



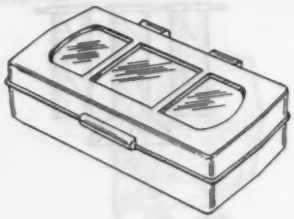
246,506
BOTTLE
John Paul Veasy, Alameda, Calif., assignor to Owens-Illinois, Inc.
Filed Dec. 18, 1975, Ser. No. 642,092
Term of patent 14 years
Int. Cl. D9—*01*
U.S. Cl. D9—137



246,507
CONTAINER FOR LIQUIDS
David Charles Danielson, Rowayton, Conn., assignor to International Business Machines Corporation, Armonk, N.Y.
Filed Mar. 1, 1976, Ser. No. 662,661
Term of patent 14 years
Int. Cl. D9—*03*
U.S. Cl. D9—175

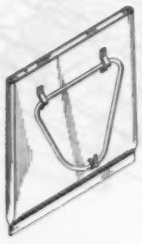


246,508
PILL BOX
Arthur A. Nudell, 3821 Sugar Loaf Lane, Skokie, Ill. 60076
Filed May 12, 1975, Ser. No. 576,569
The portion of the term of this patent subsequent to Aug. 27, 1988, has been disclaimed.
Term of patent 14 years
Int. Cl. D9—*03*
U.S. Cl. D9—183



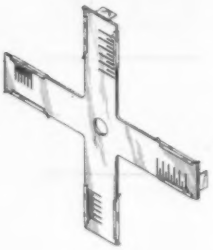
246,509
TOOTHPASTE TUBE
Sidney Hytken, 3210 Beals Branch Road, Louisville, Ky. 40206
Filed June 12, 1975, Ser. No. 586,499
Term of patent 14 years
Int. Cl. D9—*03*
U.S. Cl. D9—194

246,510
PLASTIC BAG
Spencer B. T. Lin, 3F, No. 5, Lane 4 Chin Chou St., Taipei, China /Taiwan
Filed Oct. 20, 1975, Ser. No. 623,611
Term of patent 14 years
Int. Cl. D9—*05*
U.S. Cl. D9—249



246,511
CONTAINER CLOSURE
Sidney M. Libit, 441 Lakeside Terrace, Glencoe, Ill. 60022
Filed June 2, 1975, Ser. No. 582,918
Term of patent 14 years
Int. Cl. D9—*07*
U.S. Cl. D9—267

246,512
BRAKE LINING GAUGE
Frederick R. McFarland, and Walter L. Diffenderfer, both of Lancaster, Pa., assignors to K-D Manufacturing Company, Lancaster, Pa.
Filed Jan. 20, 1976, Ser. No. 650,704
Term of patent 14 years
Int. Cl. D10—*04*
U.S. Cl. D10—64

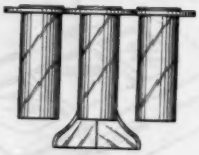


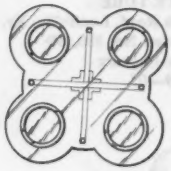
246,513
PERMANENT LAND SURVEY MARKER
Joseph Laureat Garneau, 1205 Ernest Lavigne St., Sillery, Quebec, Canada
Filed Aug. 23, 1973, Ser. No. 390,800
Term of patent 14 years
Int. Cl. D10—*99*
U.S. Cl. D10—66

246,514
HANDS FOR A TIMEPIECE
Barbara S. Honegger, 2340 Williams St., Palo Alto, Calif. 94306
Filed Mar. 15, 1976, Ser. No. 666,785
Term of patent 14 years
Int. Cl. D10—*07*
U.S. Cl. D10—127

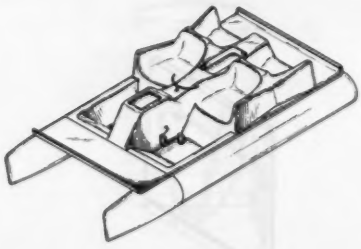
246,515
FINGER RING SETTING
Stanley M. Rosenfeld, 467 Kelton St., Los Angeles, Calif. 90024
Filed Nov. 29, 1976, Ser. No. 745,788
Term of patent 14 years
Int. Cl. D11—*01*
U.S. Cl. D11—36

246,516
PLANTER
Edward A. Wagschal, 21 E. 62nd St., New York, N.Y. 10021
Filed May 24, 1976, Ser. No. 689,486
Term of patent 14 years
Int. Cl. D11—*02*
U.S. Cl. D11—147





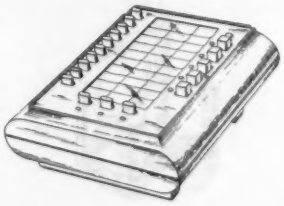
246,517
BOAT
Robert John Deputy, 4004 Forest Lane, Elkhart, Ind. 46514
Filed Aug. 19, 1976, Ser. No. 715,924
Term of patent 14 years
Int. Cl. D12—*06*
U.S. Cl. D12—68



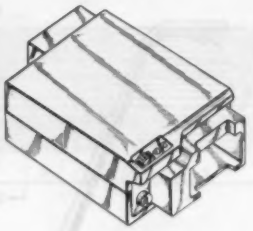
246,518
BABY CARRIAGE
Owen Finlay Maclaren, Barby, near Rugby, England, assignor to Gannet Holdings Limited, St. Peter Port, Guernsey (Channel Islands)
Filed Mar. 5, 1976, Ser. No. 664,310
Claims priority, application United Kingdom, Nov. 3, 1975, 973092/75
Term of patent 14 years
Int. Cl. D12—*12*
U.S. Cl. D12—128

246,519
HEAD PHONE
Ken Kato, Tokyo, Japan, assignor to Sansui Electric Co., Ltd., Tokyo, Japan
Filed Feb. 23, 1976, Ser. No. 660,561
Claims priority, application Japan, Aug. 22, 1975, 50-34320
Term of patent 14 years
Int. Cl. D14—*03*
U.S. Cl. D14—36

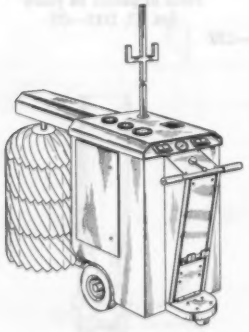
246,520
SUBSCRIBER TERMINAL CONSOLE
James Lee Fischer, Upper Arlington, Ohio, and George Payne, Bedford Hills, N.Y., assignors to Warner Cable Corporation, New York, N.Y.
Filed May 11, 1976, Ser. No. 685,289
Term of patent 14 years
Int. Cl. D14—*99*
U.S. Cl. D14—45



246,521
VEHICULAR COMMUNICATION CONVERTER APPARATUS OR SIMILAR ARTICLE
Donald Krumin, and Arnold Goldman, both of Fort Lauderdale, Fla., assignors to Motorola, Inc., Schaumburg, Ill.
Filed July 28, 1975, Ser. No. 599,902
Term of patent 14 years
Int. Cl. D14—*03*
U.S. Cl. D14—68



246,522
VEHICLE POLISHING APPARATUS
John H. Krimm, 7614 S. Gessner St., Apt. 145, Houston, Tex. 77036
Filed May 14, 1976, Ser. No. 686,558
Term of patent 14 years
Int. Cl. D15—*05*
U.S. Cl. D15—37

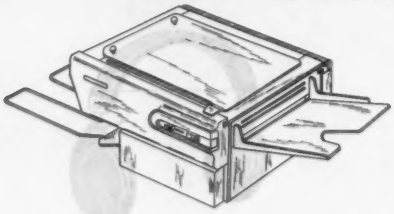


246,523
COMBINED CARPET CLEANING WAND AND HEAD THEREFOR
Robert N. Bartlett, Denver, Colo., Assignor to Windsor Industries, Inc., Denver, Colo.
Filed May 12, 1975, Ser. No. 576,563
Term of patent 14 years
Int. Cl. D15—*05*
U.S. Cl. D15—63

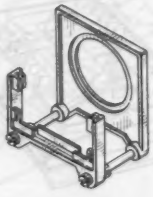
246,524
CUTTING TOOL
Olley C. Lauber, 604 N. Defiance St., Archbold, Ohio 43502
Filed Aug. 19, 1976, Ser. No. 715,671
Term of patent 14 years
Int. Cl. D15—*09*
U.S. Cl. D15—139

246,525
MOTION PICTURE CAMERA
Norbert Schlagheck, and Herbert Schultes, both of Furstenfeldbruck, Germany, assignors to AGFA-Gevaert AG, Leverkusen, Germany
Filed Apr. 14, 1976, Ser. No. 676,914
Claims priority, application Germany, Oct. 20, 1975, 5460106
Term of patent 14 years
Int. Cl. D16—*01*
U.S. Cl. D16—04

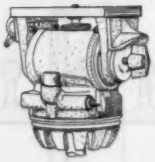
246,526
ELECTROPHOTOGRAPHICAL DUPLICATOR
Shigeru Kurozumi, Osaka, Japan, assignor to Sharp Kabushiki Kaisha, Osaka, Japan
Filed Apr. 22, 1976, Ser. No. 679,363
Claims priority, application Japan, Oct. 24, 1975, 50-42777
Term of patent 14 years
Int. Cl. D16—*03*
U.S. Cl. D16—31



246,527
VIGNETTING DEVICE
Irving S. Pfefer, 637 Anson St., Simi Valley, Calif. 93065
Filed Feb. 23, 1976, Ser. No. 660,474
Term of patent 14 years
Int. Cl. D16—*05*
U.S. Cl. D16—38

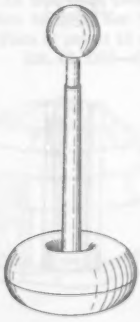


246,528
TRIPOD HEAD FOR CAMERAS OR OTHER INSTRUMENTS
Robert Eric Miller, Rose Bay, Australia, assignor to Miller-Universal (Aust.) Pty. Ltd., Rushcutters Bay, Australia
Filed Mar. 24, 1976, Ser. No. 670,005
Claims priority, application Australia, Oct. 3, 1975, 67876/75
Term of patent 14 years
Int. Cl. D16—*05*
U.S. Cl. D16—46

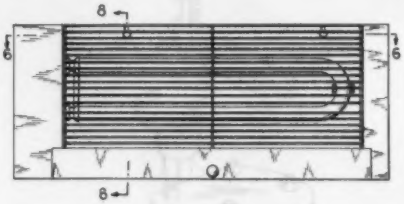


246,529
MONOCLE
Willard M. Thomas, 185 Preston Road, Columbus, Ohio 43209
Filed Mar. 22, 1976, Ser. No. 669,185
Term of patent 14 years
Int. Cl. D16—*06*; D2—*03*
U.S. Cl. D16—66

246,530
DESK SET
Walter Zeischegg, Neu-Ulm, Germany, assignor to Hans Friedrich Hefendehl, Kierspe, Germany
Filed Apr. 13, 1976, Ser. No. 676,555
Claims priority, application Germany, Oct. 15, 1975, 459
Term of patent 14 years
Int. Cl. D19—*06*
U.S. Cl. D19—75

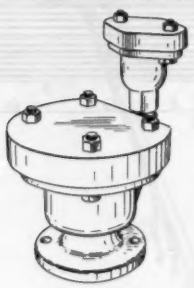


246,531
WALL-TYPE INSECT ELECTROCUTOR
Donald E. Gilbert, Box 2188, Jonesboro, Ark. 72401
Filed Apr. 13, 1977, Ser. No. 787,208
Term of patent 7 years
Int. Cl. D22—*06*
U.S. Cl. D22—19

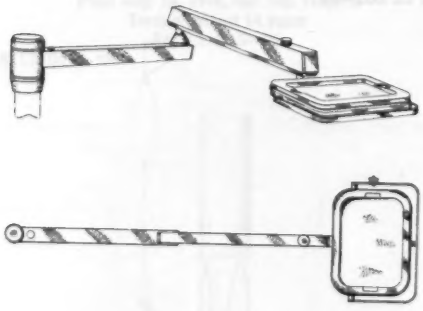


246,532
LURE TRANSFER ASSEMBLY
Orval Gene Ingram, Oklahoma City, Okla., assignor to James M. Brewer, Oklahoma City, Okla.
Filed Jan. 26, 1976, Ser. No. 652,551
Term of patent 14 years
Int. Cl. D22—*05*
U.S. Cl. D22—30

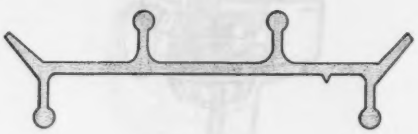
246,533
AIR VALVE FOR PIPELINES
William Henry Brockbank, Petaling Jaya, Malaysia, assignor to George Kent (Malaysia) Berhad, Malaysia
Filed Mar. 15, 1976, Ser. No. 666,953
Claims priority, application United Kingdom, Sept. 26, 1975, 972713/75
Term of patent 14 years
Int. Cl. D23—*01*
U.S. Cl. D23—19



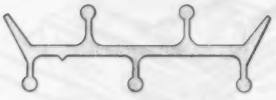
246,534
FLEXIBLE SUPPORT ARM FOR A DENTAL UNIT
George F. Buckley, 1550 Rollins Road, Burlingame, Calif. 94010
Filed Jan. 29, 1976, Ser. No. 653,968
Term of patent 14 years
Int. Cl. D24—*01*
U.S. Cl. D24—5



246,535
MICROBIOLOGICAL TEST STRIP
Michael William Dixon, Norley, England, assignor to Scientific Hospital Supplies Limited, Liverpool, England
Filed Oct. 18, 1976, Ser. No. 733,830
Term of patent 14 years
Int. Cl. D24—*02, 99*
U.S. Cl. D24—8



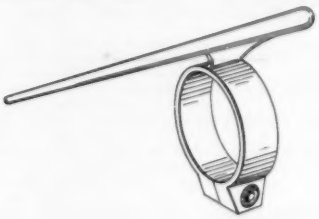
246,536
MICROBIOLOGICAL TEST STRIP
Michael William Dixon, Norley, England, assignor to Scientific Hospital Supplies Limited, Liverpool, England
Filed Oct. 18, 1976, Ser. No. 733,836
Term of patent 14 years
Int. Cl. D24—*02*; D24—*99*
U.S. Cl. D24—8



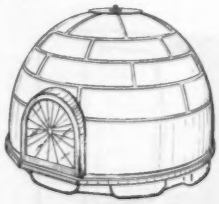
246,537
TOOTH POSITIONER MATERIAL
Woodford W. Gordon, 125 Miraloma Drive, San Francisco, Calif. 94127
Filed June 9, 1976, Ser. No. 694,335
Term of patent 14 years
Int. Cl. D24—*02*
U.S. Cl. D24—10

246,538
LIGHTER
Franz Alban Stuetzer, Muehlheim am Main, and Bernd Figur, Nieder-Roden, both of Germany, assignors to Rowenta-Werke, GmbH, Offenbach am Main, Germany
Filed Sept. 27, 1976, Ser. No. 727,093
Claims priority, application Germany, Apr. 2, 1976, 59941
Term of patent 14 years
Int. Cl. D27—*05*
U.S. Cl. D27—42

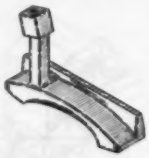
246,539
BLOW DRYER ATTACHMENT
Andre A. Nizetich, 2159 Rockinghorse Road, San Pedro, Calif. 90732
Filed Apr. 26, 1976, Ser. No. 680,489
Term of patent 3½ years
Int. Cl. D28—*03*
U.S. Cl. D28—18



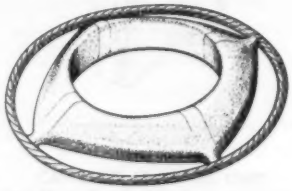
246,540
DOGHOUSE
Bill M. Burleson, P.O. Box 1123, Corsicana, Tex. 75110
Filed Nov. 10, 1975, Ser. No. 630,291
Term of patent 14 years
Int. Cl. D30—*02*
U.S. Cl. D30—1



246,541
GOLF CLUB HEAD
David W. Myers, 433 Westwood Drive North, Minneapolis, Minn. 55422
Filed Apr. 7, 1976, Ser. No. 674,633
Term of patent 14 years
Int. Cl. D21—*02*
U.S. Cl. D34—5 GH

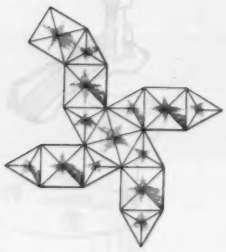


246,542
LIFE RING
Evan B. Hull, 49 Pleasant St., Northboro, Mass. 01532
Filed May 21, 1976, Ser. No. 688,736
Term of patent 14 years
Int. Cl. D29—*02*
U.S. Cl. D34—43



246,543
SKI
Rudolf Ferch, Salzburg, Austria, assignor to Kastle Geselischaft m.b.H., Ried im Innkreis, Austria
Division of Ser. No. 539,843, Jan. 9, 1975. This application May 14, 1976, Ser. No. 686,551
Claims priority, application Austria, Nov. 19, 1974, 18324183/74
Term of patent 14 years
Int. Cl. D21—*02*
U.S. Cl. D34—14 D

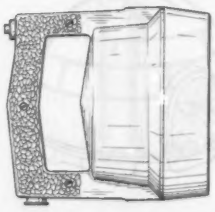
246,544
FOLDING PUZZLE
Mary Ann Paschal Brinkley, Rte. 9, Box 492, Johnson City, Tenn. 37601
Filed Apr. 10, 1975, Ser. No. 566,665
Term of patent 7 years
Int. Cl. D21—*01*
U.S. Cl. D34—15 M



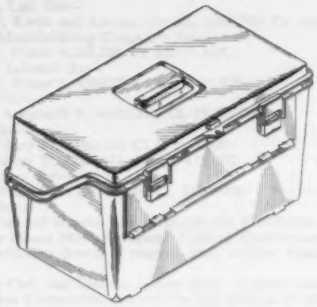
246,545
WHEELED ANIMAL FIGURE TOY
Luvenia C. Miller, 134 33rd St., NE., Washington, D.C. 20019
Filed May 18, 1976, Ser. No. 687,555
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D34—15 B

246,546
LAMP
David Kushner, 2300 Marcus Ave., New Hyde Park, N.Y. 11043
Filed Sept. 15, 1976, Ser. No. 723,561
Term of patent 14 years
Int. Cl. D26—*05, 01*
U.S. Cl. D48—20 R

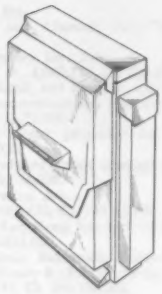
246,547
HAND HELD SPOT LIGHT
Duncan M. Payne, Tulsa, Okla., assignor to Optronics, Incorporated, Fort Gibson, Okla.
Filed Sept. 15, 1975, Ser. No. 613,262
Term of patent 14 years
Int. Cl. D26—*02*
U.S. Cl. D48—24 R

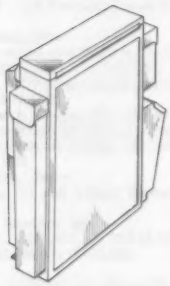


246,548
FISHING BOX
Tim M. Uyeda, S. San Gabriel, Calif., assignor to Ingersoll-Rand Company, Woodcliff Lake, N.J.
Filed July 10, 1975, Ser. No. 594,588
Term of patent 14 years
Int. Cl. D3—*02*
U.S. Cl. D87—1 R

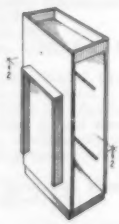


246,549
CASE FOR CONTAINING ITEMS USED BY ENGINEERS, ARCHITECTS AND THE LIKE
Eugene H. Crane, 621 Washington St. NE., Warren, Ohio 44483
Filed Nov. 17, 1975, Ser. No. 632,500
Term of patent 14 years
Int. Cl. D3—*02*
U.S. Cl. D87—1 R





246,550
CASSETTE STORAGE UNIT
Charles Robert Herk, South Curl Curl, Australia, assignor to P.P. & D. Pty. Limited, Manly, Australia
Filed Mar. 3, 1976, Ser. No. 663,531
Claims priority, application Australia, Dec. 3, 1975, 68235/75
Term of patent 14 years
Int. Cl. D3—*02*
U.S. Cl. D87—1 D



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LIST OF PATENTEES

TO WHOM

PATENTS WERE ISSUED ON THE 29TH DAY OF NOVEMBER, 1977

NOTE.—Arranged in accordance with the first significant character or word of the name (in accordance with city and telephone directory practice).

A & A Japan, Ltd.: *See—*
Sakamoto, Kenji; and Kawaai, Osamu, 4,060,765, Cl. 325-21.000.

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Verbanac, Frank, 4,060,506, Cl. 260-17.4GC.

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AB Carbox: *See—*
Trolle, Sten; and Jonson, Ake, 4,060,359, Cl. 425-78.000.

Abe, Eiichi, to Nissan Motor Company, Limited. Environmental noise pollution reduction device of running road vehicle. 4,060,142, Cl. 180-54.00A.

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Abramson, Joseph O. Battery cables and process for making same. 4,060,304, Cl. 339-224.000.

ACF Industries, Incorporated: *See—*
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Acher, Heinz, to Kraftwerk Union Aktiengesellschaft. Positioning drive for absorber rods of a nuclear reactor. 4,060,452, Cl. 176-36.00R.

Achtmann, Walfried; and Hochgesang, Gerhard, to Preh-Elektrofeinmechanische Werke - Jakob Preh Nachf. Multiple slide resistor. 4,060,789, Cl. 338-183.000.

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Adair, Gerald L. Method of making a small electric motor. 4,059,898, Cl. 29-598.000.

Adair, Harold Lee, to Raymond International Inc. Underwater gas discharge hammer with gas reservoir. 4,060,139, Cl. 173-137.000.

Adam, Alberto Eilert, to American Cyanamid Company. 6-Substituted 3-nitroimidazo[1,2-b]pyridazine for the control of hemorrhagic colitis in swine. 4,060,614, Cl. 424-250.000.

Adamis, Robert J. Handle for utensils. 4,059,867, Cl. 16-110.00A.

Adams, John M.: *See—*
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Addor, Roger Williams, to American Cyanamid Company. Method for controlling acarina. 4,060,632, Cl. 424-304.000.

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AGFA-GEVAERT N.V.: *See—*
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Akimoto, Minoru; and Tomizawa, Masaharu. Rotary pump for hot pitch, asphalt and like viscous solidifiable material. 4,060,353, Cl. 418-102.000.

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Akiyama, Taichiro. Plug for living body. 4,060,080, Cl. 128-152.000.

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Williams, George C., 4,060,815, Cl. 346-139.00A.

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Alewitz, Sam, to Perfection Corporation. Anode-fitting assembly. 4,060,472, Cl. 204-197.000.

Algeri, Harvey R.; and Stumphauzer, William C., to Nordson Corporation. Coating apparatus control including time dependent inhibitor circuit. 4,060,052, Cl. 118-2.000.

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Allemandou, Philippe Marie; and Beaudet, Didier Marcel, to Societe Anonyme de Telecommunications. Electromechanical band-pass filters. 4,060,775, Cl. 333-71.000.

Allen, Ernest Duane. Motor protector for three-phase motors. 4,060,841, Cl. 361-33.000.

Allen, Gordon Y. R. Combined mutual drainage reactor and grounding relay. 4,060,842, Cl. 361-56.000.

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Kavesh, Sheldon, 4,060,430, Cl. 148-32.000.
Nemiroff, Michael; Yue, Hong Jun; and Schevey, William Russell, 4,060,448, Cl. 156-653.000.
Peterson, James Oliver; Sukornick, Bernard; Sweeney, Richard Francis; Nychka, Henry R.; Eibeck, Richard E.; and Berenbaum, Morris B., 4,060,555, Cl. 260-586.00R.
Pieters, Wim J. M.; Carlson, Emery J.; and Pez, Guido P., 4,060,499, Cl. 252-432.000.
Smalley, Edmund W.; Kurtz, Bruce Edward; and Bandyopadhyay, Bhaskar, 4,060,460, Cl. 203-29.000.
Sweeney, Richard F.; and Peterson, James O., 4,060,469, Cl. 204-163.00R.

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Alpen, Ulrich Von; Fenner, Jurgen; Marcoll, Joachim; and Rabenau, Albrecht, to Max-Planck-Gesellschaft zur Forderung der Wissenschaften e.V. Electrochemical energy cell with solid electrolyte. 4,060,672, Cl. 429-191.000.

Alumax Mill Products, Inc.: *See—*
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Kuhn, John E., 4,060,408, Cl. 75-68.00R.

Alveru S. A.: *See—*
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Alza Corporation: *See—*
Chandrasekaran, Santosh Kumar; Urquhart, John; and Shaw, Jane Elizabeth, 4,060,084, Cl. 128-260.000.

Amabili, Arnaldo. Container and closure cap. 4,060,172, Cl. 215-295.000.

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Addor, Roger Williams, 4,060,632, Cl. 424-304.000.
Asato, Goro; and Bentley, Terence James, 4,060,627, Cl. 424-275.000.
Bernady, Karel Francis; Floyd, Middleton Brawner, Jr.; Poletto, John Frank; Schaub, Robert Eugene; and Weiss, Martin Joseph, 4,060,540, Cl. 260-448.80R.

American Optical Corporation: *See—*
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American Seating Company: *See—*
Van Loo, William Rudolph, 4,060,280, Cl. 297-452.000.

American Solar Energy Corporation: *See—*
Johnson, Donald F., 4,060,072, Cl. 126-271.000.

Ammann, Paul R.; Crimes, Peter B.; and Kim, Jonathan J., to Kennecott Copper Corporation. Mechanically stirred furnace for pyrometallurgical operations and processes. 4,060,409, Cl. 75-93.00R.

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AMP Incorporated: *See—*
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Ampco Foods Inc.: *See—*
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Amtel, Inc.: *See—*
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Amyot, Claude, to Establissements Amyot S.A. Chuck with key tightening. 4,060,251, Cl. 279-62.000.

Anderson, Paul L., to Sandoz, Inc. Anthranilic acid amides. 4,060,638, Cl. 424-324.000.

Anderson, Thomas E., to General Electric Company. Dual mode solid state inverter circuit for starting and ballasting gas discharge lamps. 4,060,751, Cl. 315-209.00R.

Andrews, James Edward: *See*—
Bethards, Charles William; and Andrews, James Edward, 4,060,764, Cl. 325-18.000.

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Annino, Raymond; Prescott, Robert C.; Karas, Edwin L.; and Kalinoski, Richard W., to Foxboro Company, The. Pneumatic chromatograph. 4,059,994, Cl. 73-23.100.

Antisari, Ottavio Vittori: *See*—
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Appell, Marc Michel: *See*—
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Arai, Shinji: *See*—
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Liu, Robert Chung-Huan; and Hughes, John Lawrence, 4,060,554, Cl. 260-565.000.

Arnold Engineering Company, The: *See*—
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ASA S.A.: *See*—
Derail, Yves C.; and Dupeubie, Jean-Claude, 4,059,948, Cl. 57-77.330.

Asahara, Yoshiyuki, to Hoya Corporation. Sealing glass for glass laser. 4,060,422, Cl. 106-47.00Q.

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Asari, Akira; and Tatsuno, Kenzou, to Kobe Steel, Ltd. Process for converting aluminum scrap into useful products. 4,059,896, Cl. 29-403.000.

Asato, Goro; and Bentley, Terence James, to American Cyanamid Company. Substituted tetrahydroiminobenzo(b)thien-4-ylureas as novel growth promoting compounds for animals. 4,060,627, Cl. 424-275.000.

Ashton, Shirley B., to Smith Company, The. Double wraparound brush assembly for vehicle washing apparatus. 4,059,862, Cl. 15-53.0AB.

Ashworth, Charles S., Jr., to Audio Alert, Inc. Security alarm system with audio monitoring capability. 4,060,803, Cl. 340-409.000.

Asinger, Friedrich; Offermanns, Heribert; and Ghyczy, Miklos, to Deutsche Gold- und Silber-Scheideanstalt Vormals Roessler. Process of making penicillamine. 4,060,548, Cl. 260-534.00S.

Askew, Barry Anthony; Holland, Ronald; Inman, Douglas; and Marikar, Yusuf Mohamed Faruq, to National Research Development Corporation. High temperature secondary batteries. 4,060,667, Cl. 429-103.000.

Ataka, Hisashi; Wako, Shigeo; and Ushio, Shintaro, to Oki Electric Industry Co., Ltd. Line connection reversing circuits. 4,060,699, Cl. 179-18.0GF.

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Atia, Ali Ezz Eldin; and Williams, Albert Edward, to Communications Satellite Corporation. Canonical dual mode filter. 4,060,779, Cl. 333-73.00W.

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Barzuza, Ytzhak. Method and apparatus for effecting the cleaning of a fluid filter. 4,060,483, Cl. 210-79.000.

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Jeserich, Wolfgang-Dieter; Cordes, Claus; Seydl, Wolfgang; and Weiss, Hans-Peter, 4,060,518, Cl. 260-78.00L.
Kindscher, Wolfgang; Fischer, Martin; Eicken, Karl; and Vitt, Guenter, 4,060,522, Cl. 260-293.850.

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Mertes, Friedrich; Doerfel, Helmut; Heil, Eduard; and Cordes, Claus, 4,060,517, Cl. 260-78.00R.
Naarmann, Herbert; Reichel, Fritz; and Gausepohl, Hermann, 4,060,679, Cl. 526-304.000.
Treptow, Wolfram; and Wunsch, Gerd, 4,060,476, Cl. 204-290.00F.
Weitz, Hans-Martin; and Fischer, Rolf, 4,060,543, Cl. 260-464.000.

BASF Wyandotte Corporation: *See—*
Ciko, John D.; and Cramer, John J., 4,060,505, Cl. 252-8.800.

Bateman, Charles Donald, to Sundstrand Data Control, Inc. Excessive sink rate warning system for aircraft. 4,060,793, Cl. 340-27.00R.

Bates, Charles L., Jr. Controlled pressure drop valve. 4,060,099, Cl. 137-625.300.

Battelle Memorial Institute: *See—*
Mallozzi, Philip J.; Epstein, Harold M.; Applebaum, David C.; Gallagher, William J.; and Campbell, Bernerd E., 4,060,769, Cl. 330-4.300.

Batzer, Hans; Habermeier, Juergen; and Porret, Daniel, to Ciba-Geigy AG. Five- or six-membered heterocyclic mono -and dialcohols. 4,060,525, Cl. 260-260.000.

Bauer, Everhard. Diverter for distributing articles supplied in one line amongst a plurality of conveying tracks. 4,060,165, Cl. 198-442.000.

Bauer, James J.; and Sagaser, Thomas M., to Clark Equipment Company. Loader main frame for skid steer loader. 4,060,261, Cl. 280-756.000.

Bauman, Dale E.; Collier, Robert J.; and Hays, Ray L., to University of Illinois Foundation. Induction of lactation in nonpregnant dairy animals. 4,060,620, Cl. 424-262.000.

Baumann, Hans-Peter; and Karmann, Hans-Georg, to Sandoz Ltd. Aromatic carboxylic acid esters and amides as fixing agents. 4,060,387, Cl. 8-169.000.

Baumgartner, Hans Ulrich: *See—*
Engeler, Paul; Baumgartner, Hans Ulrich; Dubendorfer, Ulrich; and Sonderegger, Hans Conrad, 4,059,999, Cl. 73-419.000.

Bayer Aktiengesellschaft: *See—*
Enders, Edgar; and Stendel, Wilhelm, 4,060,628, Cl. 424-277.000.
Kapps, Manfred; Mitschke, Karl-Heinz; and Schliebs, Reinhard, 4,060,571, Cl. 260-970.000.
Maass, Gunther; Lucking, Hans Joachim; Buchner, Werner; and Degen, Bruno, 4,060,537, Cl. 260-448.20E.
Meiser, Werner; Kramer, Wolfgang; Buchel, Karl Heinz; and Plempel, Manfred, 4,060,623, Cl. 424-269.000.
Schmidt, Arthur H.; Lantzsch, Reinhard; Marhold, Albrecht; Lehment, Klaus-Friedrich; and Staffe, Adolf, 4,060,549, Cl. 260-543.00F.
Sundermann, Rudolf, 4,060,541, Cl. 260-453.0AR.
vor der Bruck, Dieter; Sommer, Richard; and Wolfrum, Gerhard, 4,060,521, Cl. 260-165.000.
Wedemeyer, Karlfried; Kiel, Wolfgang; and Evertz, Werner, 4,060,562, Cl. 260-623.00R.

Bayless, John R., to Hughes Aircraft Company. Surface breakdown igniter for mercury arc devices. 4,060,748, Cl. 313-171.000.

BBC Brown Boveri & Company Limited: *See—*
Starcevic, Mihailo, 4,060,744, Cl. 310-91.000.

Beach, Burt L.: *See—*
Tremain, David L.; Beach, Burt L.; and Hadley, James C., 4,060,341, Cl. 417-182.500.

Beam, Paul E., Jr.; and Meyers, Charles K., to General Motors Corporation. Turbine shaft balancing. 4,059,972, Cl. 64-1.00V.

Bean, Bruce L.: *See—*
Bean, Roland C.; and Bean, Bruce L., 4,059,911, Cl. 37-142.500.

Bean, Roland C.; and Bean, Bruce L. Track filler attachment for center pivot irrigation systems. 4,059,911, Cl. 37-142.500.

Beatty, Albert W. Electrical connector for transmission line insulators. 4,060,301, Cl. 339-95.00R.

Beaudet, Didier Marcel: *See—*
Allemandou, Philippe Marie; and Beaudet, Didier Marcel, 4,060,775, Cl. 333-71.000.

Beck, Walter; and Burk, Werner. Self-defense apparatus comprising flashcube light source. 4,060,372, Cl. 431-93.000.

Beckman Instruments, Inc.: *See—*
Horrocks, Donald L., 4,060,728, Cl. 250-328.000.
Luitwieler, Samuel H.; and Horrocks, Donald L., 4,060,726, Cl. 250-252.000.

Beecham Group Limited: *See—*
Howarth, Thomas Trefor; and Harbridge, John Barry, 4,060,530, Cl. 260-307.0FA.
James, Brian George, 4,060,611, Cl. 424-246.000.

Behle, Gunter R.: *See—*
Baker, Forrest L.; and Behle, Gunter R., 4,060,000, Cl. 73-421.00B.

Behme, Werner; and Berleth, Manfred, to R. Jung AG Fabrik fur Prazisionsapparate. Method of specimen preparation. 4,060,440, Cl. 156-154.000.

Bell, Albert H., III, to General Motors Corporation. Centrifugal compressor with a splitter shroud in flow path. 4,060,337, Cl. 416-186.00R.

Bell & Howell Company: *See—*
Linke, Walter R.; and Fleischman, Andor A., 4,060,312, Cl. 350-189.000.
Tress, Norwood E.; and Orsinger, Winston A., 4,060,228, Cl. 271-14.000.

Bell Telephone Laboratories, Incorporated: *See—*
Mounts, Frank William; and Netravali, Arun Narayan, 4,060,834, Cl. 358-261.000.

Bendix Corporation, The: *See—*
McComas, Arthur D., 4,060,805, Cl. 343-6.5LC.

Benner, Philip E. Apparatus for removing ions from an ionized liquid. 4,060,477, Cl. 204-300.00R.

Bensky, Norman D.: *See—*
O'Day, William R., Jr.; Bensky, Norman D.; and LeBlanc, James D., 4,060,653, Cl. 427-423.000.

Bentley, Terence James: *See—*
Asato, Goro; and Bentley, Terence James, 4,060,627, Cl. 424-275.000.

Benton, Richard E., to General Tire & Rubber Company, The. Sponge rubber rug underlay having improved load bearing capacity. 4,060,502, Cl. 260-2.50P.

Berenbaum, Morris B.: *See—*
Peterson, James Oliver; Sukornick, Bernard; Sweeney, Richard Francis; Nychka, Henry R.; Eibeck, Richard E.; and Berenbaum, Morris B., 4,060,555, Cl. 260-586.00R.

Bergeron, Clifton G.; and Herron, Lester W., to University of Illinois Foundation. Article having a surface layer of catalytic ash by-product of coal combustion. 4,060,662, Cl. 428-450.000.

Berges, David A., to SmithKline Corporation. Pharmaceutical compositions comprising 7-acyl-3-(substituted triazolyl thiomethyl)-cephalosporins and methods of treating bacterial infections. 4,060,610, Cl. 424-246.000.

Bergman, Roger E.: *See—*
Cunningham, Art, deceased, 4,060,225, Cl. 366-40.000.

Bergomi, Angelo: *See—*
Tazuma, James J.; and Bergomi, Angelo, 4,060,567, Cl. 260-681.50C.

Berkley & Company, Inc.: *See—*
Rumbaugh, James T., 4,060,049, Cl. 115-6.100.

Berleth, Manfred: *See—*
Behme, Werner; and Berleth, Manfred, 4,060,440, Cl. 156-154.000.

Berliner, Julius F. T., to Burnishine Products Inc. Stainless steel cleaner. 4,060,496, Cl. 252-171.000.

Bernady, Karel Francis; Floyd, Middleton Brawner, Jr.; Poletto, John Frank; Schaub, Robert Eugene; and Weiss, Martin Joseph, to American Cyanamid Company. Novel 3-triphenylmethoxy-1-alkynes, 3-triphenyl-methoxy-1-trans-alkenyl-dialkyl-alanes, and lithium 3-triphenylmethoxy-1-trans-alkenyl-dialkyl alanates. 4,060,540, Cl. 260-448.80R.

Bernard, George G., to Union Oil Company of California. Composition and method for enhanced oil recovery utilizing aqueous polyacrylamide solutions. 4,060,490, Cl. 252-8.55D.

Bernex, Firma: *See—*
Rohland, Bernhard, 4,059,866, Cl. 16-108.000.

Berthiez, Charles William, to Berthiez, Charles William. Circular indexing plate for a machine tool. 4,060,021, Cl. 90-58.00B.

Bertin & Cie: *See—*
Guienne, Paul; Herrouin, Guy; Lafont, Andre; Bertin, Jean, deceased; Bertin, Michel; Bertin, Laurent; Bertin, Philippe; Midy nee Bertin, Catherine; Gonzalez-Camino nee Bertin, Francoise; and Bertin nee Loustau, Genevieve, heirs, 4,060,147, Cl. 180-121.000.

Bertin, Jean, deceased: *See—*
Guienne, Paul; Herrouin, Guy; Lafont, Andre; Bertin, Jean, deceased; Bertin, Michel; Bertin, Laurent; Bertin, Philippe; Midy nee Bertin, Catherine; Gonzalez-Camino nee Bertin, Francoise; and Bertin nee Loustau, Genevieve, heirs, 4,060,147, Cl. 180-121.000.

Bertin, Laurent: *See—*
Guienne, Paul; Herrouin, Guy; Lafont, Andre; Bertin, Jean, deceased; Bertin, Michel; Bertin, Laurent; Bertin, Philippe; Midy nee Bertin, Catherine; Gonzalez-Camino nee Bertin, Francoise; and Bertin nee Loustau, Genevieve, heirs, 4,060,147, Cl. 180-121.000.

Bertin, Michel: *See—*
Guienne, Paul; Herrouin, Guy; Lafont, Andre; Bertin, Jean, deceased; Bertin, Michel; Bertin, Laurent; Bertin, Philippe; Midy nee Bertin, Catherine; Gonzalez-Camino nee Bertin, Francoise; and Bertin nee Loustau, Genevieve, heirs, 4,060,147, Cl. 180-121.000.

Bertin nee Loustau, Genevieve, heirs: *See—*
Guienne, Paul; Herrouin, Guy; Lafont, Andre; Bertin, Jean, deceased; Bertin, Michel; Bertin, Laurent; Bertin, Philippe; Midy nee Bertin, Catherine; Gonzalez-Camino nee Bertin, Francoise; and Bertin nee Loustau, Genevieve, heirs, 4,060,147, Cl. 180-121.000.

Bertin, Philippe: *See—*
Guienne, Paul; Herrouin, Guy; Lafont, Andre; Bertin, Jean, deceased; Bertin, Michel; Bertin, Laurent; Bertin, Philippe; Midy nee Bertin, Catherine; Gonzalez-Camino nee Bertin, Francoise; and Bertin nee Loustau, Genevieve, heirs, 4,060,147, Cl. 180-121.000.

Bethards, Charles William; and Andrews, James Edward, to Motorola, Inc. Transceiver audio system. 4,060,764, Cl. 325-18.000.

Bettencourt, Thomas S.; and Marshall, Lowell K., to University of California, The Regents of the. Method for mechanically harvesting tomatoes. 4,060,133, Cl. 171-1.000.

Betzien, Gunter: *See—*
Rothe, Werner; Heinemann, Helmut; Schmidt, Felix Helmut; and Betzien, Gunter, 4,060,634, Cl. 424-321.000.

Bickford, John H.; Ranheim, Donald H., Jr.; and Saxby, Willard A., to Raymond Engineering Inc. Torque wrench. 4,060,137, Cl. 173-12.000.

Bienert, Horst; Jardin, Hans; and Schatzler, Walter, to Webasto-Werk W. Baier GmbH & Co. Motor vehicle roof. 4,060,274, Cl. 296-137.00G.

Bienvenu, Jacques Michel Jean; Cassonnet, Jean-Claude Marcel; and Appell, Marc Michel, to Compagnie Internationale pour l'Informatique Cii-Honeywell Bull. Data input and output controller. 4,060,849, Cl. 364-200.000.

Bierlich, Johannes Harald. Operating mechanism for doors and windows. 4,059,924, Cl. 49-192.000.

Bildtsen, Sven Christian: *See*—
Arsenius, Torsten Henry; and Bildtsen, Sven Christian, 4,060,288, Cl. 308-73.000.

Biochemie Gesellschaft m.b.H.: *See*—
Riedl, Kurt, 4,060,542, Cl. 260-454.000.

Bioengineering Research S.A.: *See*—
Della Bianca, Luciano, 4,060,348, Cl. 417-475.000.

Bird, Forrest M. Ventilator and method. 4,060,078, Cl. 128-145.800.

Birnie, Peter Alexander, to Post Office. Digital switching center. 4,060,698, Cl. 179-15.0AT.

Bishop, David C., to Chemical-Ways Corporation. Precision metering system for the delivery of abrasive lapping and polishing slurries. 4,059,929, Cl. 51-263.000.

Bison-werke Bahre & Greten GmbH & Co. KG: *See*—
Pampel, Helmut, 4,060,580, Cl. 264-109.000.

Bisson, Jean-Pierre: *See*—
Risler, Pierre; Gireau, Jean; Rose, Pierre; and Bisson, Jean-Pierre, 4,060,645, Cl. 426-302.000.

Bjerklie, John W.: *See*—
LaHaye, Paul G.; Bjerklie, John W.; and Gallant, Gerald G., Jr., 4,060,379, Cl. 432-179.000.

Bjorling, Gotthard E.: *See*—
Fahlstrom, Per Anders Herman Henningsson; Mioen, Thomas Konrad; and Bjorling, Gotthard E., 4,060,464, Cl. 204-113.000.

Black and Decker Manufacturing Company, The: *See*—
Alessio, Lorenzo Ercole, 4,059,930, Cl. 51-268.000.

Blair, Bruce A. System for hog production in a controlled environment. 4,060,054, Cl. 119-16.000.

Blanks, William L. Method and apparatus for identifying color separation film. 4,060,643, Cl. 428-195.000.

Blaser, Bruno; Germscheid, Hans-Gunther; and Worms, Karl-Heinz, to Henkel Kommanditgesellschaft auf Aktien. Process for the manufacture of acylation products of phosphorous acid. 4,060,546, Cl. 260-502.40A.

Blaser Engine, Ltd.: *See*—
Blaser, Florencio, 4,060,059, Cl. 123-32.0ST.

Blaser, Florencio, to Blaser Engine, Ltd. Internal combustion engine. 4,060,059, Cl. 123-32.0ST.

Blenner, Henry E.: *See*—
Marshall, Bruce H.; and Blenner, Henry E., 4,060,297, Cl. 339-37.000.

Blinchikoff, Herman J., to Westinghouse Electric Corporation. Intermediate-band crystal filter with low-transient response. 4,060,776, Cl. 333-72.000.

Blomer, Alois; and Schulze, Hans. Splint and body-support device. 4,060,075, Cl. 128-90.000.

Blum, Albert. Submersible pump with guide means. 4,060,345, Cl. 417-360.000.

Bocanegra Marquina, Jesus. Handle for hand tools to be rotated during operation. 4,060,115, Cl. 145-61.00G.

Boehringer Mannheim G.m.b.H.: *See*—
Groppenbacher, Gregor; Rieckmann, Peter; and Rothe, Werner, 4,060,598, Cl. 424-33.000.
Hrstka, Vladimir; Hubner, Manfred; Kuhr, Manfred; Schmidt, Felix Helmut; and Aumuller, Walter, 4,060,626, Cl. 424-274.000.
Rothe, Werner; Heinemann, Helmut; Schmidt, Felix Helmut; and Betzien, Gunter, 4,060,634, Cl. 424-321.000.

Boey, Jozef Martin: *See*—
Janssen, Paul Adriaan Jan; Van Daele, Georges Henri Paul; and Boey, Jozef Martin, 4,060,528, Cl. 260-295.00R.

Bogenschutz, Thomas M.; Engle, Thomas H.; and McEathron, Eugene D., to General Signal Corporation. Rail car brake apparatus. 4,060,152, Cl. 188-52.000.

Boice, Elvin G., to Reynolds Metals Company. Wear resistant drill pipe collar and method of making same. 4,060,286, Cl. 308-4.00A.

Boliden Aktiebolag: *See*—
Fahlstrom, Per Anders Herman Henningsson; Mioen, Thomas Konrad; and Bjorling, Gotthard E., 4,060,464, Cl. 204-113.000.

Bolt, James S., to Alco Standard Corporation. Furnace having burners supplied with heated air. 4,060,380, Cl. 432-179.000.

Bolton, Dewayne P.: *See*—
Hoffman, Gerald F.; and Bolton, Dewayne P., 4,060,123, Cl. 165-11.000.

Bonafe, Ubaldo: *See*—
Tirabassi, Tiziano; Giovanelli, Giorgio; Cesari, Giulio; Bonafe, Ubaldo; and Antisari, Ottavio Vittori, 4,060,326, Cl. 356-96.000.

Bongartz, Paul; and Haag, Franz, to Motan Gesellschaft mit beschrankter Haftung. Device for mixing granular and/or pulverous substances. 4,060,223, Cl. 366-179.000.

Boning, Manfred: *See*—
Rieger, Werner; Boning, Manfred; Dalferth, Hans; and Smetz, Reinhard, 4,060,269, Cl. 294-78.00A.

Bonnet, Ludwig: *See*—
Hiltebrandt, Siegfried; and Bonnet, Ludwig, 4,060,087, Cl. 128-303.150.

Borden Products Limited: *See*—
Widmann, Marcel, 4,060,572, Cl. 261-18.00B.

Borg, David G.: *See*—
Postupack, Constantine; Borg, David G.; Junk, Norman M.; Oswald, Gerald L.; and Bowman, Arthur F., 4,060,033, Cl. 102-24.00R.

Borg-Warner Corporation: *See*—
Newton, Alwin B., 4,060,343, Cl. 417-309.000.

Bost, Charles H. Protection circuit for multiple phase power systems. 4,060,843, Cl. 361-76.000.

Bost, Jean Remy, to Automobiles Peugeot. Transmission assembly comprising a main gearbox in series with countershafting providing at least two gear ratios. 4,060,005, Cl. 74-745.000.

Botos, Imre; and Hellquist, Ivan Aldine, to AGA Aktiebolag. Breathing apparatus incorporating depth compensation. 4,060,076, Cl. 128-142.00R.

Bottcher, Dieter; Schulz, Heinz; and Stahlecker, Fritz, to Stahlecker, Fritz; and Stahlecker, Hans. Method and apparatus for start-spinning a thread on open-end spinning units. 4,059,946, Cl. 57-34.00R.

Bourgeois, Hugues: *See*—
Fournier, Daniel; and Bourgeois, Hugues, 4,060,475, Cl. 204-270.000.

Bower, Allen M., to Emco Wheaton Inc. Vapor recovery nozzle. 4,060,110, Cl. 141-207.000.

Bowers, Paul E.; and Phadke, Mukund A., to Arnold Engineering Company, The. Portable demagnetizer. 4,060,845, Cl. 361-149.000.

Bowman, Arthur F.; and Camerini, Francis J., to Atlas Powder Company. Delay booster assembly. 4,060,034, Cl. 102-24.00R.

Bowman, Arthur F.: *See*—
Postupack, Constantine; Borg, David G.; Junk, Norman M.; Oswald, Gerald L.; and Bowman, Arthur F., 4,060,033, Cl. 102-24.00R.

Bowman, Harry Frederick, to Massachusetts Institute of Technology. Apparatus for the measurement of thermal properties of biomaterials. 4,059,982, Cl. 73-15.00A.

Boyce, Richard M.: *See*—
Randolph, Arthur J.; and Boyce, Richard M., 4,059,889, Cl. 29-706.000.

Bradshaw, Janice; Cook, Martin Christopher; and Gregory, Gordon Ian. Cephalosporins having a 7-(carboxy substituted α-etherified oximinoarylacetamido) group. 4,060,686, Cl. 544-22.000.

Braid, John Edwin, to Interox Chemicals Limited. Bleaching. 4,060,644, Cl. 426-261.000.

Brambilla, Luigi: *See*—
Scholz, Hansjurgen; Backhaus, Hans-Gerd; Brambilla, Luigi; and Gimbel, Jurgen, 4,060,004, Cl. 73-514.000.

Brandenberger, Stanley G.: *See*—
McClure, James D.; and Brandenberger, Stanley G., 4,060,565, Cl. 260-671.00C.

Brandis, Helmut; Von Den Steinen, Albert; and Engineer, Serosh, to Thyssen Edelstahlwerke Aktiengesellschaft. Heat-treatable steel. 4,060,431, Cl. 148-36.000.

Branson, Charles D., to Robertshaw Controls Company. Fuel control system and method of operating the same and diverter valve therefor. 4,060,192, Cl. 236-46.00D.

Bratzler, Karl: *See*—
Eisenlohr, Karl-Heinz; and Bratzler, Karl, 4,060,595, Cl. 423-574.00R.

Brawley, Thomas Scott. Bearing component and method of making same. 4,060,290, Cl. 308-216.000.

Breheret, Michel Francois; Wambergue, Andre Raphael; and Carpentier, Andre Jacques, to Ateliers Breheret S.A.R.L. Mechanical couplings for pontoons and similar floatable units. 4,060,048, Cl. 114-266.000.

Brenner, Gunter: *See*—
Credner, Karl; Geisel, Berthold; Brenner, Gunter; and Tauscher, Manfred, 4,060,617, Cl. 424-253.000.

Bricon, Jean-Pierre Luc, to International Harvester Company. Hydraulic actuated grab bucket. 4,059,886, Cl. 29-426.000.

Bridger, Robert F.; and Schmitt, Kirk D., to Mobil Oil Corporation. Lubricant composition. 4,060,491, Cl. 252-50.000.

Bright, Gene Michael, to Pfizer Inc. 6-Acylamido-2,2-dimethyl-3-(pyrimidin-4,6-dione-2-yl)penams. 4,060,524, Cl. 260-256.50R.

Brill, Robert M.: *See*—
Barile, Conrad A.; Brill, Robert M.; Forneris, John L.; and Regh, Joseph, 4,060,427, Cl. 148-1.500.

Bringi, Naganathan Viswanath; and Padley, Frederick Bolton, to Lever Brothers Company. Food fat. 4,060,646, Cl. 426-607.000.

Brodersen, Robert W.: *See*—
Tasch, Al F., Jr; Frye, Robert Charles; Fu, Horng-Sen; and Brodersen, Robert W., 4,060,738, Cl. 307-238.000.

Brooks, Barry J.: *See*—
Stowe, Milton G.; and Brooks, Barry J., 4,060,249, Cl. 277-24.000.

Brown, Donald J., to Knox Manufacturing Co. Detachable modular drive unit for projection screen apparatus. 4,060,310, Cl. 350-117.000.

Brown & Sharpe Manufacturing Company: *See*—
Levesque, George N., 4,060,007, Cl. 74-457.000.

Bruins, Victor Leonard: *See*—
van Heel, Hubertus Johannes Gerardus; Bruins, Victor Leonard; and Smid, Joost, 4,060,391, Cl. 23-264.000.

Bruinsma, Bote: *See*—
Cowan, Wavell Frederick; and Bruinsma, Bote, 4,059,992, Cl. 73-95.000.

Brune, Gerhard; and Hans, Waldemar, to Robert Bosch G.m.b.H. Electromagnetic fuel injection valve. 4,060,199, Cl. 239-488.000.

Bryant and May: *See*—
Lanham, Albert Frank; Barned, Philip Sydney; and Potter, Sydney Ralph, 4,060,434, Cl. 149-2.000.

Bryden, Kenneth; and Barrett, Norman C. Footwear apparatus. 4,059,910, Cl. 36-103.000.

Buchan Industries, Inc.: *See—*
Baccile, Anthony, 4,060,330, Cl. 402-47.000.

Buchel, Karl Heinz: *See—*
Meiser, Werner; Kramer, Wolfgang; Buchel, Karl Heinz; and Plempel, Manfred, 4,060,623, Cl. 424-269.000.

Buchner, Werner: *See—*
Maass, Gunther; Lucking, Hans Joachim; Buchner, Werner; and Degen, Bruno, 4,060,537, Cl. 260-448.20E.

Budnik, Frederick, to Minnesota Mining and Manufacturing Company. Thermal switch. 4,060,787, Cl. 337-408.000.

Buiter, Pieter; van der Burgt, Maarten J.; and Van Helden, Henricus J. A., to Shell Internationale Research Maatschappij B.V. Two stage partial combustion process for solid carbonaceous fuels. 4,060,397, Cl. 48-197.00R.

Bulthius, Kornelis: *See—*
Lakerveld, Herman Gerard; van Rosmalen, Gerard Eduard; Bulthius, Kornelis; and Sinjou, Johannes Petrus, 4,060,248, Cl. 274-41.60R.

Bundy, Gordon L., to Upjohn Company, The. 9-Deoxy-9-methylene-PGF compounds. 4,060,534, Cl. 260-408.000.

Bunker Ramo Corporation: *See—*
Gearin, John M., 4,060,298, Cl. 339-48.000.

Burk, Charles B.: *See—*
Chmura, William J.; Slusarski, Ronald S.; and Burk, Charles B., 4,059,879, Cl. 29-148.40R.

Burk, Werner: *See—*
Beck, Walter; and Burk, Werner, 4,060,372, Cl. 431-93.000.

Burke, John F.: *See—*
Yannas, Ioannis V.; Burke, John F.; Gordon, Philip L.; and Huang, Chor, 4,060,081, Cl. 128-156.000.

Burke, William P., Jr.: *See—*
Bares, James D.; and Burke, William P., Jr., 4,060,098, Cl. 137-594.000.

Burks, Howard L., to Wingfield, Perino B., a part interest. Vending and dispensing bin. 4,060,111, Cl. 141-231.000.

Burnishine Products Inc.: *See—*
Berliner, Julius F. T., 4,060,496, Cl. 252-171.000.

Burns, Fredrick B.; and Balint, Peter, to E Z Painter Corporation. Slotted tool handle. 4,060,215, Cl. 248-360.000.

Buros, Melvin S., to Micr-Shield Company. Document carrier. 4,060,711, Cl. 235-488.000.

Burroughs Wellcome Co.: *See—*
Schaeffer, Howard John, 4,060,616, Cl. 424-253.000.

Burt, Richard Owen, to Bartles (Carn Brea) Limited. Method of and apparatus for separating fractions of different density contained in ores or other solid materials. 4,060,482, Cl. 209-432.000.

Burton, James V. Wafered fuel of compressed wood products. 4,060,396, Cl. 44-14.000.

Butement, William Alan Stewart. Electro-photographic element. 4,060,321, Cl. 355-8.000.

Byer, Norman E.; Stokowski, Stanley E.; and Venables, John D., to Martin Marietta Corporation. Pyroelectric detector with decreased susceptibility to vibrational noise. 4,060,729, Cl. 250-338.000.

Calver, Paul Newton: *See—*
Taylor-Brown, Terence John; Calver, Paul Newton; and Jack, James, deceased, 4,060,648, Cl. 427-32.000.

Camerini, Francis J.: *See—*
Bowman, Arthur F.; and Camerini, Francis J., 4,060,034, Cl. 102-24.00R.

Campana, Patsie Carmen. Coke oven door frame and jamb. 4,060,459, Cl. 202-248.000.

Campbell, Bernerd E.: *See—*
Mallozzi, Philip J.; Epstein, Harold M.; Applebaum, David C.; Gallagher, William J.; and Campbell, Bernerd E., 4,060,769, Cl. 330-4.300.

Canada, Atomic Energy of, Limited: *See—*
McKeown, Joseph, 4,060,762, Cl. 324-71.0EB.

Candor, James T. Electrostatic method and apparatus for making a patterned, non-woven sheet. 4,060,449, Cl. 162-109.000.

Canon Kabushiki Kaisha: *See—*
Hirayama, Kazuhiro; Sato, Yasushi; Tokiwa, Taisuke; Kawakubo, Kazuo; Iwatate, Fujio; and Nakatsui, Hisashi, 4,060,322, Cl. 355-60.000.
Hirayama, Kazuhiro; Sato, Yasushi; Tokiwa, Taisuke; Iwatate, Fujio; Kawakubo, Kazuo; and Nakatsui, Hisashi, 4,060,323, Cl. 355-60.000.

Cantwell, Alan David Cole: *See—*
Lee, Denis; and Cantwell, Alan David Cole, 4,060,463, Cl. 204-99.000.

Carl, William L.: *See—*
Stein, Charles R.; and Carl, William L., 4,060,801, Cl. 340-324.00R.

Carlin, Eunice A. Method of marking for garment pattern. 4,060,436, Cl. 156-63.000.

Carlson, David Emil; and Tracy, Chester Edwin, to RCA Corporation. Deposition of transparent amorphous carbon films. 4,060,660, Cl. 428-408.000.

Carlson, Emery J.: *See—*
Pieters, Wim J. M.; Carlson, Emery J.; and Pez, Guido P., 4,060,499, Cl. 252-432.000.

Carlson, Jeffrey Allen: *See—*
Abel, Stephen Carl; and Carlson, Jeffrey Allen, 4,060,006, Cl. 74-258.000.

Carpentier, Andre Jacques: *See—*
Breheret, Michel Francois; Wambergue, Andre Raphael; and Carpentier, Andre Jacques, 4,060,048, Cl. 114-266.000.

Carstedt, Howard B. Automatic sheet decurler. 4,060,236, Cl. 271-183.000.

Carter, Samuel R.: *See—*
Neal, Willie, 4,060,697, Cl. 179-1.0VE.

Carter, Sidney T., to A-T-O Inc. Rotary glue picker. 4,060,229, Cl. 271-33.000.

Carter, Sidney T., to A-T-O Inc. Apparatus embodying continuous conveyors for applying labels to containers. 4,060,446, Cl. 156-475.000.

Carteus, Marc Felix Maurice; De Bruyne, Yvrs Marie Grovgrs; Lemmens, Jean Pierre Gustaaf Rosa; and Stubbe, Elie Jozef, to Societe de Traction et D'Electricite S.A. Water supply pipe for a steam generator. 4,060,057, Cl. 122-451.00R.

Cassonnet, Jean-Claude Marcel: *See—*
Bienvenu, Jacques Michel Jean; Cassonnet, Jean-Claude Marcel; and Appell, Marc Michel, 4,060,849, Cl. 364-200.000.

Castagnos, Leonce F., Jr.; and Pratt, Roy E., to Texaco Inc. Fluidized cracking catalyst regeneration apparatus. 4,060,395, Cl. 23-288.00B.

Castner, Kenneth F., to Goodyear Tire & Rubber Company, The. Olefin metathesis process and catalyst therefor. 4,060,468, Cl. 204-158.00R.

Caterpillar Tractor Co.: *See—*
Gee, James Edgar; and Ohms, Edward Joseph, 4,060,289, Cl. 308-187.100.
Hendrickson, Vergil Philip; and Cole, Carroll Richard, 4,060,136, Cl. 172-795.000.

Catt, John David: *See—*
Matier, William Lesley; and Catt, John David, 4,060,615, Cl. 424-251.000.

Catterfeld, Fritz C., to Rockwell International Corporation. Self-propelled deep well turbine drill. 4,060,141, Cl. 175-94.000.

Cav Limited: *See—*
Jarret, Boaz Antony, 4,060,347, Cl. 417-392.000.

Cesari, Giulio: *See—*
Tirabassi, Tiziano; Giovanelli, Giorgio; Cesari, Giulio; Bonafe, Ubaldo; and Antisari, Ottavio Vittori, 4,060,326, Cl. 356-96.000.

Chabot, Daniel H.; Peterson, Robert S.; and Plumer, Roy D., to General Motors Corporation. Inertial ring lock. 4,060,117, Cl. 151-43.000.

Chandrasekaran, Santosh Kumar; Urquhart, John; and Shaw, Jane Elizabeth, to Alza Corporation. Method and therapeutic system for providing chemotherapy transdermally. 4,060,084, Cl. 128-260.000.

Chaney, Lynn Harold; and Smith, Glenn S., to Eaton Corporation. Hoist cooling system. 4,060,159, Cl. 192-113.00B.

Chang, Yun-Te. Non-condensation mirror. 4,060,712, Cl. 219-219.000.

Chauvette, Robert R., to Eli Lilly and Company. Cephalosporin intermediates. 4,060,688, Cl. 544-30.000.

Chayet, Emil L., to Solar Energy Dynamics Corporation. Solar collector for solar heating systems. 4,060,071, Cl. 126-271.000.

Chechenets, Akhmet Galievich: *See—*
Kaporovich, Vladimir Georgievich; Udovenko, Vitaly Kirillovich; Krasnorutsky, Viktor Petrovich; and Chechenets, Akhmet Galievich, 4,059,977, Cl. 72-69.000.

Check, Frank Thomas, Jr., to Pitney Bowes Inc. Date printing device with electronic calendar clock. 4,060,720, Cl. 235-309.000.

Chelin, Charles R.; and Hickman, Alan J., to Towmotor Corporation. Adjustable arbor wheel mounting arrangement. 4,060,151, Cl. 187-95.000.

Chemical-Ways Corporation: *See—*
Bishop, David C., 4,059,929, Cl. 51-263.000.

Chemie Linz Aktiengesellschaft: *See—*
Garber, Alfred; Stonner, Hans-Martin; Wiesner, Paul; Sinclair, Alan; and Schmidt, Alfred, 4,060,591, Cl. 423-352.000.

Cherepanova, Valentina Pavlovna: *See—*
Khromov-Borisov, Nikolai Vasilievich; Torf, Samuil Fedorovich; Cherepanova, Valentina Pavlovna; Danilov, Anatoly Fedorovich; and Starshinova, Larisa Alexandrovna, 4,060,652, Cl. 424-329.000.

Chesebrough-Pond's, Inc.: *See—*
Russo, Ronald D., 4,060,074, Cl. 128-2.080.

Chevron Research Company: *See—*
Gomaa, Ezzat E.; and Young, Roger E., 4,060,129, Cl. 166-252.000.
Reed, Marion G.; and Jaffe, Joseph, 4,060,480, Cl. 208-111.000.

Chiba, Kazukiyo: *See—*
Matsumoto, Takeshi; Chiba, Kazukiyo; Shioyama, Atsuo; and Yamaguchi, Yoshitake, 4,060,143, Cl. 180-64.00A.

Chiesa, Peter J., Jr., to Philadelphia Suburban Corporation. Fire fighting with thixotropic foam. 4,060,132, Cl. 169-47.000.

Chiesa, Peter J., Jr., to Philadelphia Suburban Corporation. Fire fighting with thixotropic foam. 4,060,489, Cl. 252-3.000.

Chmura, William J.; Slusarski, Ronald S.; and Burk, Charles B., to Textron Inc. Method for the controlled mechanical working of sintered porous powder metal shapes to effect surface and subsurface densification. 4,059,879, Cl. 29-148.40R.

Choby, Edward G., Jr., to Allegheny Ludlum Industries, Inc. Method of soldering with phosphoric acid soldering flux. 4,060,191, Cl. 228-207.000.

Chore-Time Equipment, Inc.: *See—*
Skinner, Mark, 4,060,055, Cl. 119-48.000.

Christ, Alfred; and Lehmann, Rolf, to Escher-Wyss Limited. Rolling mill. 4,059,976, Cl. 72-19.000.

Christensen, Burton G.; and Ratcliffe, Ronald W., to Merck & Co., Inc. Cephalosporins having a 3-α substituted alkyl grouping. 4,060,687, Cl. 544-27.000.

Chrysler Corporation: *See*—
Lappington, John P.; and Shafer, Leroy, 4,060,714, Cl. 364-431.000.
Chrysler United Kingdom Limited: *See*—
Jones, Clive, 4,060,011, Cl. 74-498.000.
Wyman, Howard John, 4,060,009, Cl. 74-573.00R.
Chunat, Gerald W.; and Maloney, James E., to Economics Laboratory, Inc. Foam phosphatizing method and composition. 4,060,433, Cl. 148-6.170.
Church, Wayne Edward; and Quist, Frederick Fenn, Jr., to International Business Machines Corporation. Embossing gate roller. 4,060,230, Cl. 271-63.000.
Ciba-Geigy AG: *See*—
Batzer, Hans; Habermeier, Juergen; and Porret, Daniel, 4,060,525, Cl. 260-260.000.
Ciba-Geigy Corporation: *See*—
Karrer, Friedrich, 4,060,629, Cl. 424-300.000.
Kleiner, Eduard K.; and Dear, Robert Ernest Arthur, 4,060,681, Cl. 560-222.000.
Ciecuch, Ronald F. W.; Luhowy, Roberta R.; Meneghini, Frank A.; and Rogers, Howard G., to Polaroid Corporation. Diffusion transfer elements comprising color-providing compounds capable of cleavage upon reaction with silver ions and silver ion barrier layers. 4,060,417, Cl. 96-3.000.
Ciko, John D.; and Cramer, John J., to BASF Wyandotte Corporation. Compositions for souring and softening laundered textile materials and stock solutions prepared therefrom. 4,060,505, Cl. 252-8.800.
Cincinnati Milacron-Heald Corporation: *See*—
Robillard, Edward G., 4,059,927, Cl. 51-165.770.
Cincinnati Milacron, Inc.: *See*—
Molt, Kenneth Richard, 4,060,513, Cl. 260-45.75N.
Robillard, Edward George, 4,060,755, Cl. 318-571.000.
Cinco, Salvatore A., to Tenneco Chemicals, Inc. Process for the production of metal salts of organic acids. 4,060,535, Cl. 260-414.000.
Citizen Watch Co., Ltd.: *See*—
Kuroda, Yoshiyuki, 4,060,185, Cl. 224-4.00F.
Claassen, Volkert: *See*—
Welle, Hendricus Bernardus Antonius; and Claassen, Volkert, 4,060,631, Cl. 424-304.000.
Clark Equipment Company: *See*—
Bauer, James J.; and Sagaser, Thomas M., 4,060,261, Cl. 280-756.000.
Clarke, Peter J. Sputtering apparatus and method. 4,060,470, Cl. 204-192.00R.
Clavenna, LeRoy R.; Longo, John M.; and Horowitz, Harold S., to Exxon Research and Engineering Company. Preparation of mixed metal oxides by decomposition of carbonate solid solutions having the calcite structure. 4,060,500, Cl. 252-471.000.
Cloup, Jean. Controlled inlet valves for metering pumps. 4,060,351, Cl. 417-520.000.
Cloutier, Donald C.: *See*—
Hefni, Ibrahim El; Green, Kenneth A.; and Cloutier, Donald C., 4,060,778, Cl. 333-73.00W.
Coaltek Associates: *See*—
Davis, Rufus F., Jr., 4,060,458, Cl. 201-40.000.
Coignet S.A.: *See*—
Fougea, Bernard, 4,060,358, Cl. 425-65.000.
Cole, Carroll Richard: *See*—
Hendrickson, Vergil Philip; and Cole, Carroll Richard, 4,060,136, Cl. 172-795.000.
Cole, Donald G., to Silent Sentry, Inc. Alarm switch having resilient gripping structure for sensing unauthorized movement of a door. 4,060,704, Cl. 200-61.620.
Coleman, James H., to Sprague Electric Company. Paint curtain machine and method of painting. 4,060,649, Cl. 427-79.000.
Colgate-Palmolive Company: *See*—
Cordon, Martin, 4,060,599, Cl. 424-49.000.
Karami, Hamzeh, 4,060,085, Cl. 128-287.000.
McGhie, Russell Park, 4,060,179, Cl. 222-92.000.
Collica, Carl; Epifano, Leonard; and Farella, Ralph, to Medi-Ray, Inc. Syringe shield. 4,060,073, Cl. 128-1.100.
Collier, Robert J.: *See*—
Bauman, Dale E.; Collier, Robert J.; and Hays, Ray L., 4,060,620, Cl. 424-262.000.
Collins, Cecil A., to Fisher, Robert C. Seat belt control system. 4,060,260, Cl. 280-747.000.
Collins, Paul W.; and Pappo, Raphael, to G. D. Searle & Co. 7-{3-Hydroxy-2-[4-hydroxy-4-(lower alkyl)-trans-1-octen-1-yl]-5-oxocyclopent-1-yl}heptanoic acids and esters. 4,060,691, Cl. 560-121.000.
Collins, Richard D., to Maryland Cup Corporation. Method for producing seamless foam plastic cups from expandable sidewall blanks. 4,060,577, Cl. 264-45.400.
Collombin, Andre Marcel; and Salomon, Georges Pierre Joseph, to Ets. Francois Salomon et Fils S.A. Device for connecting a skier's leg to a ski. 4,060,256, Cl. 280-613.000.
Communications Satellite Corporation: *See*—
Atia, Ali Ezz Eldin; and Williams, Albert Edward, 4,060,779, Cl. 333-73.00W.
Community Blood Council of Greater New York, Inc., The: *See*—
Rowe, Arthur W.; and Dayian, George, 4,059,967, Cl. 62-64.000.
Compagnie Industrielle des Piles Electriques Cipel: *See*—
Anes, Lionel, 4,060,666, Cl. 429-91.000.
Compagnie Internationale pour l'Informatique Cii-Honeywell Bull: *See*—
Bienvenu, Jacques Michel Jean; Cassonnet, Jean-Claude Marcel; and Appell, Marc Michel, 4,060,849, Cl. 364-200.000.
Compo Industries, Inc.: *See*—
Santos, John J., Jr.; and Tassone, Joseph V., 4,059,861, Cl. 12-145.000.
Conn, Michael L., to United Technologies Corporation. High security lock. 4,060,846, Cl. 361-193.000.
Connors, Robert Harvey, to Triangle Package Machinery Co. Control system for cyclic operations. 4,060,736, Cl. 307-141.000.
Consolidated Products Corporation: *See*—
Roe, Norman P., 4,059,951, Cl. 57-149.000.
Continental Group, Inc., The: *See*—
Pan, Peter N. Y.; and Hernandez, Rafael J., 4,060,647, Cl. 427-21.000.
Continental Oil Company: *See*—
Doerr, Richard E., 4,060,281, Cl. 302-14.000.
Leach, Bruce Eugene, 4,060,560, Cl. 260-621.00D.
Starks, Charles M., 4,060,561, Cl. 260-621.00F.
Control Systems Research, Inc.: *See*—
Jones, Donald H., 4,060,799, Cl. 340-198.000.
Cook, Martin Christopher: *See*—
Bradshaw, Janice; Cook, Martin Christopher; and Gregory, Gordon Ian, 4,060,686, Cl. 544-22.000.
Copal Company Limited: *See*—
Tachihara, Noribumi; Mizohata, Yukio; and Makita, Jun-ichi, 4,059,916, Cl. 40-130.00K.
Copley, Russell Dean: *See*—
Trimble, David Lee; Copley, Russell Dean; Jensen, James Keith; and Schlueter, Francis Edward, 4,059,942, Cl. 56-30.000.
Corbeij, Peter H. J.; and Talsma, Tjitte, to U.S. Philips Corporation. Television deflection coil unit. 4,060,836, Cl. 358-248.000.
Cordes, Charles P. Adjustable drum. 4,060,019, Cl. 84-411.00R.
Cordes, Claus: *See*—
Jeserich, Wolfgang-Dieter; Cordes, Claus; Seydl, Wolfgang; and Weiss, Hans-Peter, 4,060,518, Cl. 260-78.00L.
Mertes, Friedrich; Doerfel, Helmut; Heil, Eduard; and Cordes, Claus, 4,060,517, Cl. 260-78.00R.
Cordon, Martin, to Colgate-Palmolive Company. Dentifrices. 4,060,599, Cl. 424-49.000.
Cotti, Gino, to Ankerfarm, S.p.A. Water-soluble derivative of 6-deoxytetracyclines. 4,060,605, Cl. 424-227.000.
Cousse, Henri: *See*—
Stenger, M. Antoine; Cousse, Henri; and Mouzin, M. Gilbert, 4,060,637, Cl. 424-324.000.
Coutin, Pierre Fernand: *See*—
Hasquenoph, Jean H.; and Coutin, Pierre Fernand, 4,060,213, Cl. 244-137.00R.
Cowan, Wavell Frederick; and Bruinsma, Bote, to Pulmac Instruments Ltd. Apparatus for testing the tensile strength of sheet material. 4,059,992, Cl. 73-95.000.
Cox, William Edward; and Lee, Frank James, to Post Office. Vibratory tools. 4,060,138, Cl. 173-49.000.
Cramer, John J.: *See*—
Ciko, John D.; and Cramer, John J., 4,060,505, Cl. 252-8.800.
Crane, Stanley J. Inflatable suit for cyclists. 4,059,852, Cl. 2-2.000.
Crawford, Charles S. Quick disconnect coupler and safety check valve. 4,060,219, Cl. 251-149.600.
Credner, Karl; Geisel, Berthold; Brenner, Gunter; and Tauscher, Manfred, to Wulfing, Johann A. Esters of the ophyllinylacetic acid. 4,060,617, Cl. 424-253.000.
Cremeans, George E.: *See*—
Sinclair, Richard G.; and Cremeans, George E., 4,060,511, Cl. 260-34.200.
Crimes, Peter B.: *See*—
Ammann, Paul R.; Crimes, Peter B.; and Kim, Jonathan J., 4,060,409, Cl. 75-93.00R.
Croissant, Jean, to Automobiles Peugeot. Device for stowing away a spare-wheel on an automobile vehicle. 4,060,270, Cl. 296-37.200.
Crossbow, Inc.: *See*—
Trott, David H., 4,059,997, Cl. 73-352.000.
Crystal Thermoplastics, Inc.: *See*—
Dahl, Nils J., 4,060,173, Cl. 220-4.00B.
Cunningham, Art, deceased (by Cunningham, Velma Ruth, executrix), to Bergman, Roger E. Wheelbarrow with removable mixer. 4,060,225, Cl. 366-40.000.
Cunningham, Velma Ruth, executrix: *See*—
Cunningham, Art, deceased, 4,060,225, Cl. 366-40.000.
Cure, Omer Paul, to Electro-Nite Co. Molten metal sample cup containing blob for promoting carbide formation. 4,059,996, Cl. 73-354.000.
Curtiss-Wright Corporation: *See*—
Woodier, George H.; and Mount, Robert E., 4,060,352, Cl. 418-122.000.
Cuzzone, Raymond, to General Electric Company. Electric fuse with sealed indicator. 4,060,786, Cl. 337-244.000.
Daehne, Welf von; and Rasmussen, Poul Rodbroe, to Leo Pharmaceutical Products Ltd. A/S. 16-Ethers of fusidic acid derivatives. 4,060,606, Cl. 424-238.000.
Dahl, Nils J., to Crystal Thermoplastics, Inc. Container. 4,060,173, Cl. 220-4.00B.
Daicel Co., Ltd.: *See*—
Moriwaki, Takeshi, 4,059,921, Cl. 47-73.000.
Daimler-Benz Aktiengesellschaft: *See*—
Scholz, Hansjurgen; Backhaus, Hans-Gerd; Brambilla, Luigi; and Gimbel, Jurgen, 4,060,004, Cl. 73-514.000.
Steiner, Adolf, 4,060,284, Cl. 303-100.000.
Dainippon Screen Seizo Kabushiki-Kaisha: *See*—
Sakamoto, Takashi, 4,060,829, Cl. 358-80.000.
D'Alelio, Gaetano Francis, to University of Notre Dame du Lac.

Chain-extending nitrile end-capped polyimides. 4,060,515, Cl. 260-63.00R.
Dalferth, Hans: *See—*
Rieger, Werner; Boning, Manfred; Dalferth, Hans; and Smetz, Reinhard, 4,060,269, Cl. 294-78.00A.
Dalinowski, Alfred A. Computer for solving unknown parameters of geometrical figures. 4,060,719, Cl. 364-729.000.
DaMert, Frederick A. Method for applying stiffener to computer paper. 4,060,651, Cl. 427-285.000.
Damian J. Jenny AG: *See—*
Jenny, Damian Johann, 4,060,027, Cl. 99-450.100.
Dandine, Pierre. Trigger assembly for spring loaded weapons. 4,060,067, Cl. 124-31.000.
Danilov, Anatoly Fedorovich: *See—*
Khromov-Borisov, Nikolai Vasilievich; Torf, Samuil Fedorovich; Cherepanova, Valentina Pavlovna; Danilov, Anatoly Fedorovich; and Starshinova, Larisa Alexandrovna, 4,060,652, Cl. 424-329.000.
Darby, David L.; and Darby, James W. Method of making a composite burial vault. 4,060,581, Cl. 264-131.000.
Darby, James W.: *See—*
Darby, David L.; and Darby, James W., 4,060,581, Cl. 264-131.000.
Dauber, Howard. Electrical outlet and switchbox locator. 4,059,907, Cl. 33-174.00G.
Davern, John W.: *See—*
Vargo, Joseph, Jr.; and Davern, John W., 4,060,189, Cl. 227-53.000.
Davies, Eric, deceased (by Davies, Olivia Maude, co-executor); and by Marr, Douglas Philip, co-executor, to Marconi Company Limited, The. Phased array radars. 4,060,806, Cl. 343-17.700.
Davies, Olivia Maude, co-executor: *See—*
Davies, Eric, deceased; and Marr, Douglas Philip, co-executor, 4,060,806, Cl. 343-17.700.
Davis, Hugh M.; and Miller, Alan H., to De Laval Turbine Inc. Rotor seal element with heat resistant alloy coating. 4,060,250, Cl. 277-53.000.
Davis, Lee; and Pang, Peter, to I-T-E Imperial Corporation. Solid state tripping circuit. 4,060,844, Cl. 361-96.000.
Davis, Rufus F., Jr., to Coaltek Associates. Separation of gas from solids. 4,060,458, Cl. 201-40.000.
Davy-Loewy Limited: *See—*
Marshall, Robert, 4,060,029, Cl. 101-4.000.
Dayian, George: *See—*
Rowe, Arthur W.; and Dayian, George, 4,059,967, Cl. 62-64.000.
DDSA Pharmaceuticals: *See—*
Shenoy, Umakant Devdas, 4,060,608, Cl. 424-244.000.
de la Parra M., Rodolfo. Thermal motor of action and reaction forces. 4,059,961, Cl. 60-670.000.
De Laval Turbine Inc.: *See—*
Davis, Hugh M.; and Miller, Alan H., 4,060,250, Cl. 277-53.000.
Dean, Anthony Vincent; and Ennis, Philip James, to International Nickel Company, Inc., The. Manganese-nickel alloys. 4,060,429, Cl. 148-31.000.
Dear, Robert Ernest Arthur: *See—*
Kleiner, Eduard K.; and Dear, Robert Ernest Arthur, 4,060,681, Cl. 560-222.000.
De Bruyne, Yvrs Marie Grovgrs: *See—*
Carteus, Marc Felix Maurice; De Bruyne, Yvrs Marie Grovgrs; Lemmens, Jean Pierre Gustaaf Rosa; and Stubbe, Elie Jozef, 4,060,057, Cl. 122-451.00R.
Decca Limited: *See—*
Hansford, Reginald Frederick, 4,060,318, Cl. 353-42.000.
Deck, Arthur M., to Goodman Manufacturing Corporation. Damper assembly. 4,060,024, Cl. 98-40.0VM.
Deere & Company: *See—*
Trimble, David Lee; Copley, Russell Dean; Jensen, James Keith; and Schlueter, Francis Edward, 4,059,942, Cl. 56-30.000.
Degen, Bruno: *See—*
Maass, Gunther; Lucking, Hans Joachim; Buchner, Werner; and Degen, Bruno, 4,060,537, Cl. 260-448.20E.
Degen, Klaus; and Herrmann, Herbert, to Roland Offsetmaschinenfabrik Faber & Schleicher AG. Sheet positioning mechanism for feed table of a sheet-fed printing press. 4,060,237, Cl. 271-231.000.
Delesandri, Domenico. Hose clamp assembly. 4,059,872, Cl. 24-284.000.
Deli, Joseph; and Stevens, Henry C., to PPG Industries, Inc. Method of controlling weeds with N-(3-methyl-5-isothiazolyl)-2-methylpentanamide. 4,060,403, Cl. 71-90.000.
Della Bianca, Luciano, to Bioengineering Research S.A. Roller pump carrying out alternate pumping operations, particularly suited to extra-corporeal blood circulation. 4,060,348, Cl. 417-475.000.
Demaine, David George Anthony; and Norrie, David Gordon, to Rank Organisation Limited, The. Face plate graticule. 4,060,307, Cl. 350-96.00B.
Demido, Michael; and Shellhause, Ronald L., to General Motors Corporation. Brake actuating pressure proportioning system and proportioner modifying arm therefor. 4,060,283, Cl. 303-6.00C.
de Nora, Vittorio: *See—*
Giuffre, Luigi; de Nora, Vittorio; and Spaziante, Placido, 4,060,473, Cl. 204-253.000.
De Palacio, Raul Calderon. Level indicators for liquids. 4,059,995, Cl. 73-301.000.
Depew, Noel F.: *See—*
Nelson, Carl R.; Pierce, David R.; Depew, Noel F.; and Harp, Marlyn F., 4,060,161, Cl. 197-1.00R.
Derail, Yves C.; and Dupeuble, Jean-Claude, to ASA S.A.; and Societa Nazionale Industria Applicazioni Viscosa S.p.A. Automatic threading false-twist spindle. 4,059,948, Cl. 57-77.330.
de Ruiter, Jacob Willem: *See—*
Naastepad, Pieter Aart; and de Ruiter, Jacob Willem, 4,060,692, Cl. 13-26.000.
Dettling, Paul. Tube bending machine. 4,059,978, Cl. 72-156.000.
Deuchar, Robert C.; and Waitzman, Gene J. Combustion engine powered floor buffer. 4,059,863, Cl. 15-98.000.
Deutsche Gold- und Silber-Scheideanstalt Vormals Roessler: *See—*
Asinger, Friedrich; Offermanns, Heribert; and Ghyczy, Miklos, 4,060,548, Cl. 260-534.00S.
Klingler, Karl H.; Aurich, Rudolf; and Habersang, Silke, 4,060,618, Cl. 424-253.000.
Devimeux, Daniel Pierre Yvon; and Stouls, Francois-Xavier Antoine, to Societe Anonyme de Telecommunications. Digit rate reducing method in video signal transmission. 4,060,832, Cl. 358-133.000.
Devro, Inc.: *See—*
Ziolko, Francis Joseph, 4,060,361, Cl. 425-131.100.
Dey, Arabinda N., to P. R. Mallory & Co. Inc. Ion exchange membranes and organic electrolyte cells employing same. 4,060,673, Cl. 429-192.000.
Dey, Arabinda N.; and Holmes, Robert W., to P. R. Mallory & Co. Inc. Metal periodate organic electrolyte cells. 4,060,676, Cl. 429-217.000.
Diamond, Julius; and Douglas, George H., to William H. Rorer, Inc. Amidinoureas for treating diarrhea. 4,060,635, Cl. 424-322.000.
Dias, Francesco: *See—*
Luhleich, Hartmut; Nickel, Hubertus; and Dias, Francesco, 4,060,592, Cl. 423-448.000.
Diehl, Marcus I.: *See—*
Schweig, Eugene S., Jr.; and Diehl, Marcus I., 4,060,444, Cl. 156-391.000.
DiGiacinto, Joseph A. Sprayer hydroponic grower. 4,059,922, Cl. 47-82.000.
Dimitrov, Spas Petkov: *See—*
Stoev, Stoycho Mitrev; Metodiev, Metodi Stoyanov; Kuzev, Lyubomir Vladimirov; Vedrichkov, Petko Georgiev; Sapunarov, Ivan Mitrev; Vassilev, Vasil Vladimirov; Dimitrov, Spas Petkov; Gasharov, Vihar Assenov; Russev, Sheko Kolev; and Mitrev, Kostadin Georgiev, 4,060,481, Cl. 209-170.000.
Dionne, Leonard J., to Polaroid Corporation. Photographic apparatus with lens focusing scale. 4,060,817, Cl. 354-198.000.
Dirlam, John P., to Pfizer Inc. 1-Alkoxy-1-substituted phenyl-1,3-dehydrofuro[3,4-b]quinoxaline-4,9-dioxides. 4,060,523, Cl. 260-250.0QN.
Di Rosa, Gaetano, to FATA S.p.A. Low-pressure die casting machine. 4,060,122, Cl. 164-304.000.
Ditto, Edwin D., to General Motors Corporation. Method of alloying and forming a valve seat. 4,059,876, Cl. 29-156.70A.
Divecha, Amarnath P., to A Silag Inc. Method for preparing a fiber reinforced metal matrix using microscopic fibers. 4,060,412, Cl. 75-203.000.
DIY-Sol, Inc.: *See—*
Rapp, Felix, Jr.; and Barron, James M., 4,060,195, Cl. 237-1.00A.
Dobson, Charles Edward. Panel device. 4,059,914, Cl. 40-125.00F.
Dr. C. Otto & Comp. G.m.b.H.: *See—*
Oldengott, Hans, 4,059,885, Cl. 29-401.00F.
Doerfel, Helmut: *See—*
Mertes, Friedrich; Doerfel, Helmut; Heil, Eduard; and Cordes, Claus, 4,060,517, Cl. 260-78.00R.
Doerr, Richard E., to Continental Oil Company. Coal slurry feeder. 4,060,281, Cl. 302-14.000.
Doi, Tetsuo: *See—*
Yamada, Takahiro; and Doi, Tetsuo, 4,060,813, Cl. 346-75.000.
Doi, Yasuhiko; Tokura, Yukio; and Imaizumi, Koji, to Minolta Camera Kabushiki Kaisha. Transfer material separating device. 4,060,320, Cl. 355-3.00R.
Dolfini, Joseph E.; and MacKenzie, Robert D., to Richardson-Merrell Inc. Ethylenediamine derivatives useful in treating sickle cell anemia. 4,060,630, Cl. 424-300.000.
Dollond & Aitchison (Services) Limited: *See—*
Eadow-Allen, Stuart, 4,059,925, Cl. 51-100.00R.
Domer, Michel; and Hay, Jean-Yves, to Societe Paulstra. Spherical couplings for vehicle towing or kindred purposes. 4,060,331, Cl. 403-130.000.
Domergue, Annick Marthe Suzanne Simone; and Sureau, Robert Frederic Michel, to Produits Chimiques Ugine Kuhlmann. Coumarin derivatives. 4,060,531, Cl. 260-308.00R.
Doss, Richard C.; and Murtha, Timothy P., to Phillips Petroleum Company. Polythiol sealants. 4,060,519, Cl. 260-79.000.
Douglas, George H.: *See—*
Diamond, Julius; and Douglas, George H., 4,060,635, Cl. 424-322.000.
Douno, Syugo, to Glory Kogyo Kabushiki Kaisha. Coin stacker in automatic coin wrapping apparatus. 4,060,093, Cl. 133-1.00A.
Dow Chemical Company, The: *See—*
Olstowski, Franciszek, 4,060,509, Cl. 260-30.60R.
Dow Corning Corporation: *See—*
Schroeder, Fred, 4,060,435, Cl. 149-19.200.
Dowling, Donald J.; and Schoen, William, to Texaco Inc. Apparatus and method for measuring the water content of oil flowing in a pipe. 4,059,987, Cl. 73-61.10R.
Drechsel, Erhart Karl: *See—*
Sardisco, John B.; and Drechsel, Erhart Karl, 4,060,586, Cl. 423-167.000.
Dreibelbis, Richard C.; and Turner, Warren E., to Emerson Electric Co. (H&H Thermostats Div.). Dispensing head assembly for fluid dispensing system and a nozzle therefor made of plastic material. 4,060,198, Cl. 239-24.000.

Drouin, Claude, to Les Industries BFG Limitee. Window unit for use in oven doors. 4,060,069, Cl. 126-200.000.

Duarte, Manuel G.: *See—*
Duarte, Ruben G.; and Duarte, Manuel G., 4,060,365, Cl. 425-214.000.

Duarte, Ruben G.; and Duarte, Manuel G. Dough press. 4,060,365, Cl. 425-214.000.

Dubendorfer, Ulrich: *See—*
Engeler, Paul; Baumgartner, Hans Ulrich; Dubendorfer, Ulrich; and Sonderegger, Hans Conrad, 4,059,999, Cl. 73-419.000.

Duckett, William Arthur, to Jonas Woodhead Limited. Hydraulic shock absorber. 4,060,155, Cl. 188-282.000.

Dugdale, Bernard: *See—*
Tilley, Leslie Joseph; and Dugdale, Bernard, 4,060,734, Cl. 250-560.000.

Dulaney, Eugene L.: *See—*
Jacobus, David P.; Dulaney, Eugene L.; and Grier, Nathaniel, 4,060,639, Cl. 424-325.000.

Dunlop Limited: *See—*
Allitt, Bernard Charles, 4,060,357, Cl. 425-36.000.

Dunstheimer, Mathias. Animal holder. 4,059,869, Cl. 17-44.000.

Dunston, Virgil M. Push pull exercising device. 4,060,240, Cl. 272-126.000.

Dupeuble, Jean-Claude: *See—*
Derail, Yves C.; and Dupeuble, Jean-Claude, 4,059,948, Cl. 57-77.330.

Du Pont de Nemours, E. I., and Company: *See—*
Evans, Arlyn Wayne, 4,060,404, Cl. 71-93.000.
Hoover, Fred Wayne; and Iler, Ralph K., 4,060,488, Cl. 210-433.00M.
Klopping, Hein Louis, 4,060,624, Cl. 424-273.00R.
Klopping, Hein Louis, 4,060,625, Cl. 424-273.00R.
Lee, Lin-Fa, 4,059,949, Cl. 57-140.0BY.
Nelson, Thomas Larson, 4,059,873, Cl. 28-271.000.
Welch, Aaron Waddington, 4,060,405, Cl. 71-93.000.

Durant, Graham John; Emmett, John Colin; and Ganellin, Charon Robin, to Smith Kline & French Laboratories Limited. Pyridyl alkylguanidine compounds. 4,060,621, Cl. 424-263.000.

Dyal, John P. Method for fitting dentures to various jaw positions. 4,059,899, Cl. 32-2.000.

Dybel, Frank R.: *See—*
Dybel, William P.; and Dybel, Frank R., 4,059,991, Cl. 73-88.50R.

Dybel, William P.; and Dybel, Frank R. Modular constructed load sensing system. 4,059,991, Cl. 73-88.50R.

Dynamit Nobel Aktiengesellschaft: *See—*
El Chahawi, Moustafa; and Richtzenhain, Hermann, 4,060,690, Cl. 560-55.000.
Kotzsch, Hans-Joachim; and Vahlensieck, Hans-Joachim, 4,060,536, Cl. 260-448.20E.
Kotzsch, Hans Joachim; Vahlensieck, Hans-Joachim; and Seiler, Claus-Dieter, 4,060,538, Cl. 260-448.80R.
Seiler, Claus-Dietrich; Vahlensieck, Hans-Joachim; and Amort, Jurgen, 4,060,539, Cl. 260-448.80R.

E Z Painter Corporation: *See—*
Burns, Fredrick B.; and Balint, Peter, 4,060,215, Cl. 248-360.000.

Eadow-Allen, Stuart, to Dollond & Aitchison (Services) Limited. Machine for forming a curved surface on a workpiece. 4,059,925, Cl. 51-100.00R.

Eastman Kodak Company: *See—*
Merkel, Paul Barrett; and Ling, Hans Gway, 4,060,420, Cl. 96-114.100.

Eaton Corporation: *See—*
Chaney, Lynn Harold; and Smith, Glenn S., 4,060,159, Cl. 192-113.00B.
Frailly, Robert A., 4,060,116, Cl. 151-7.000.
Goscenski, Edward J., Jr., 4,060,146, Cl. 180-161.000.

Eaton, Thomas, to I T L Technology, Inc. Dialysis apparatus. 4,060,485, Cl. 210-87.000.

Ebel, Fred H.: *See—*
Landgraf, Glenn A.; and Ebel, Fred H., 4,060,227, Cl. 270-66.000.

Eckold, Gerd-Jurgen; and Maass, Hans. Hand tool. 4,060,046, Cl. 113-54.00R.

Economics Laboratory, Inc.: *See—*
Chunat, Gerald W.; and Maloney, James E., 4,060,433, Cl. 148-6.170.

Edstrom, Richard C.: *See—*
Feldeisen, Ronald F.; Minchak, John A.; Gerstman, Richard B.; Meyers, Herbert M.; and Edstrom, Richard C., 4,060,105, Cl. 141-1.000.

Edwards, Ronald Alexander Nixon; and Manrique, Jorge, to Unisearch Limited. Protein isolation. 4,060,203, Cl. 241-7.000.

Egorov, Boris Afanasievich; Grzhimalovsky, Alexandr Sergeevich; Judin, Alexandr Vladimirovich; Fishman, Konstantin Evgenievich; and Vernaya, Ljudmila Dmitrievna. Method of manufacturing polyoxymethylene filaments. 4,060,582, Cl. 264-210.00F.

Eibeck, Richard E.: *See—*
Peterson, James Oliver; Sukornick, Bernard; Sweeney, Richard Francis; Nychka, Henry R.; Eibeck, Richard E.; and Berenbaum, Morris B., 4,060,555, Cl. 260-586.00R.

Eicken, Karl: *See—*
Kindscher, Wolfgang; Fischer, Martin; Eicken, Karl; and Vitt, Guenter, 4,060,522, Cl. 260-293.850.

Eisenlohr, Karl-Heinz; and Bratzler, Karl, to Metallgesellschaft Aktiengesellschaft. Process for recovering elemental sulfur from gases having a high carbon dioxide content and containing sulfur compounds. 4,060,595, Cl. 423-574.00R.

El Chahawi, Moustafa; and Richtzenhain, Hermann, to Dynamit Nobel Aktiengesellschaft. Method of preparing arylacetic acid alkyl esters. 4,060,690, Cl. 560-55.000.

Electricite De France: *See—*
Mascarello, Jean Marius; Godin, Paul; and Millet, Jacques Francois, 4,060,466, Cl. 204-129.000.

Electro-Nite Co.: *See—*
Cure, Omer Paul, 4,059,996, Cl. 73-354.000.

Eli Lilly and Company: *See—*
Chauvette, Robert R., 4,060,688, Cl. 544-30.000.

Elliott Enterprises of Monte Vista: *See—*
Elliott, Lillard H., 4,059,939, Cl. 52-745.000.

Elliott, Lillard H., to Elliott Enterprises of Monte Vista. Prefabricated building unit. 4,059,939, Cl. 52-745.000.

Ellis, Delmar H., to General Electric Company. Method and apparatus for measuring deflection of rotating airfoils. 4,060,329, Cl. 356-167.000.

Elscint, Ltd.: *See—*
Zioni, Jacob; Klein, Yitzhak; and Inbar, Dan, 4,060,730, Cl. 250-369.000.

Emco Wheaton Inc.: *See—*
Bower, Allen M., 4,060,110, Cl. 141-207.000.

Emerson Electric Co.: *See—*
Fleer, Thomas P., 4,060,370, Cl. 431-62.000.

Emerson Electric Co. (H&H Thermostats Div.): *See—*
Dreibelbis, Richard C.; and Turner, Warren E., 4,060,198, Cl. 239-24.000.

Emmett, John Colin: *See—*
Durant, Graham John; Emmett, John Colin; and Ganellin, Charon Robin, 4,060,621, Cl. 424-263.000.

Enders, Edgar; and Stendel, Wilhelm, to Bayer Aktiengesellschaft. 2-(Alkylhalophenylimino)dithiolanes and ectoparasiticidal composition and method. 4,060,628, Cl. 424-277.000.

Energiagazdalkodasi Intezet: *See—*
Peredi, Karoly, 4,060,376, Cl. 432-24.000.
Peredi, Karoly, 4,060,378, Cl. 432-96.000.

Energy Products of Idaho: *See—*
Sowards, Norman K., 4,060,041, Cl. 110-8.00F.

Engeler, Paul; Baumgartner, Hans Ulrich; Dubendorfer, Ulrich; and Sonderegger, Hans Conrad, to Kistler Instrumente AG. Pressure transducers for plastic substances. 4,059,999, Cl. 73-419.000.

Engineer, Serosh: *See—*
Brandis, Helmut; Von Den Steinen, Albert; and Engineer, Serosh, 4,060,431, Cl. 148-36.000.

Engle, Thomas H.: *See—*
Bogenschutz, Thomas M.; Engle, Thomas H.; and McEathron, Eugene D., 4,060,152, Cl. 188-52.000.

English Electric Valve Company Limited: *See—*
Howorth, Jonathan Ross; Goss, Alan Jerome; and Pool, Peter James, 4,060,823, Cl. 357-30.000.

English, Milton: *See—*
Osborne, Ray L., 4,059,883, Cl. 29-259.000.

Ennis, Philip James: *See—*
Dean, Anthony Vincent; and Ennis, Philip James, 4,060,429, Cl. 148-31.000.

Epifano, Leonard: *See—*
Collica, Carl; Epifano, Leonard; and Farella, Ralph, 4,060,073, Cl. 128-1.100.

Epley, John M., to Hearing Evaluation & Acoustic Research, Inc. Method for testing acoustical attenuation of hearing protectors. 4,060,701, Cl. 179-175.000.

Epstein, Harold M.: *See—*
Mallozzi, Philip J.; Epstein, Harold M.; Applebaum, David C.; Gallagher, William J.; and Campbell, Bernerd E., 4,060,769, Cl. 330-4.300.

Ernest, Robert P.: *See—*
Hideg, Laszlo; and Ernest, Robert P., 4,060,058, Cl. 123-8.090.

Ernst, Arnold E. Implement re-alignment hitch. 4,060,254, Cl. 280-461.00A.

Ernst Leitz GmbH Wetzlar: *See—*
Rapp, Wolfgang; Haas, Karl-Heinz; and Luessem, Heribert, 4,060,388, Cl. 23-230.00R.

Ernyei, Herbert, to Societe Lignes Telegraphiques et Telephoniques. Electromechanical band-pass filter for high frequencies. 4,060,774, Cl. 333-71.000.

Escher-Wyss Limited: *See—*
Christ, Alfred; and Lehmann, Rolf, 4,059,976, Cl. 72-19.000.

Etablissements Amyot S.A.: *See—*
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Etablissements Carpano & Pons: *See—*
Saligny, Yves, 4,060,302, Cl. 339-97.00R.

Etablissements Nativelle S.A.: *See—*
Jarreau, Francois-Xavier; and Sarfati, Roger Gerard, 4,060,607, Cl. 424-241.000.

Ets. Francois Salomon et Fils S.A.: *See—*
Collombin, Andre Marcel; and Salomon, Georges Pierre Joseph, 4,060,256, Cl. 280-613.000.

Evans, Arlyn Wayne, to Du Pont de Nemours, E. I., and Company. Selective herbicide for sugarcane. 4,060,404, Cl. 71-93.000.

Evans, Charles P., to Laser Graphic Systems Corporation. Substrate for composite printing and relief plate. 4,060,032, Cl. 101-401.100.

Evenheat Kiln, Inc.: *See—*
Watson, John C.; Watson, John D.; and Watson, Gerald K., 4,060,381, Cl. 432-247.000.

Everett, Seth Leroy, Jr. Keyboard switch assembly with tactile feedback having illuminated laminated layers including opaque or transparent conductive layer. 4,060,703, Cl. 200-5.00A.

Evertz, Werner: *See*—
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Evtuhov, Viktor: *See*—
Barnoski, Michael K.; and Evtuhov, Viktor, 4,060,308, Cl. 350-96.00C.
Exxon Research and Engineering Company: *See*—
Clavenna, LeRoy R.; Longo, John M.; and Horowitz, Harold S., 4,060,500, Cl. 252-471.000.
Klemann, Lawrence P.; and Newman, Gerald H., 4,060,674, Cl. 429-194.000.
Lang, Robert J., 4,060,478, Cl. 208-8.000.
F. Kuppersbusch & Sohne Aktiengesellschaft: *See*—
Lohr, Alfred; and Tschek, Wolfgang, 4,060,026, Cl. 99-346.000.
Fabri-Tek Incorporated: *See*—
Hoffman, Gerald F.; and Bolton, Dewayne P., 4,060,123, Cl. 165-11.000.
Fahlstrom, Per Anders Herman Henningsson; Mioen, Thomas Konrad; and Bjorling, Gotthard E., to Boliden Aktiebolag. Method for extracting and recovering iron and nickel in metallic form. 4,060,464, Cl. 204-113.000.
Faid, Robert W., to W. R. Grace & Co. Post-applied waterstop. 4,059,935, Cl. 52-396.000.
Fanciullo, Ralph D., to Polaroid Corporation. Flat battery. 4,060,669, Cl. 429-152.000.
Fanner Pty. Limited: *See*—
Shaw, Alan Douglas, 4,059,988, Cl. 73-579.000.
Farella, Ralph: *See*—
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Farris, Russell E.: *See*—
Stanley, Lester N.; and Farris, Russell E., 4,060,544, Cl. 260-465.00D.
FATA S.p.A.: *See*—
Di Rosa, Gaetano, 4,060,122, Cl. 164-304.000.
Faucz, Eugene C., to Xerox Corporation. Magnetic latent image creation. 4,060,811, Cl. 346-74.100.
Faulkner, Richard Dale, to RCA Corporation. Phototube having domed mesh with non-uniform apertures. 4,060,747, Cl. 313-95.000.
Federal-Mogul Corporation: *See*—
Glover, Douglas; and Minter, Marvin J., 4,059,990, Cl. 73-81.000.
Feeney, George W.; and Habeck, Bruce W., to Goodyear Tire & Rubber Company, The. Adhesive composition. 4,060,503, Cl. 260-5.000.
Feigt, Ingmar: *See*—
Jantsch, Ottomar; Feigt, Ingmar; and Willig, Wolf Rudiger, 4,060,822, Cl. 357-30.000.
Feldeisen, Ronald F.; Minchak, John A.; Gerstman, Richard B.; Meyers, Herbert M.; and Edstrom, Richard C., to Xerox Corporation. Toner loading apparatus with replenishing supply container. 4,060,105, Cl. 141-1.000.
Feldman, Paul S.; Johnson, Robert B.; and Nibby, Chester M., Jr., to Honeywell Information Systems Inc. Apparatus and method for generating timing signals for latched type memories. 4,060,794, Cl. 364-900.000.
Fenner, Jurgen: *See*—
Alpen, Ulrich Von; Fenner, Jurgen; Marcoll, Joachim; and Rabenau, Albrecht, 4,060,672, Cl. 429-191.000.
Fenton, Donald M.; and Vaell, Raoul P., to Union Oil Company of California. Reducing the consumption of anthraquinone disulfonate in stretford solutions. 4,060,594, Cl. 423-573.00R.
Fergestad, Petter I., to A/S National Industri. Electrical inductive apparatus. 4,060,784, Cl. 336-84.00R.
Ferland, Jean-Marie; Laliberte, Real; Lippmann, Wilbur; and Pugsley, Thomas A., to Ayerst McKenna and Harrison Ltd. 3-Aryloxy-2(4-loweralkyl-1-piperazinyl)propanols, their alkylethers, and use thereof. 4,060,613, Cl. 424-250.000.
Fiberglass Specialty Co., Inc.: *See*—
Rysgaard, John R., Sr., 4,060,175, Cl. 220-85.00B.
Fick, Paul A., to National Machinery Company, The. Apparatus for making shouldered tubular rivets. 4,059,860, Cl. 10-11.00R.
Filippov, Vladimir Jurievich: *See*—
Savin, Nikolai Ivanovich; Ternikova, Tamara Alexandrovna; Filippov, Vladimir Jurievich; and Shiryaev, Vladimir Ivanovich, 4,060,127, Cl. 165-145.000.
Finkelman, Morris, to Amcar Industries, Ltd. Oyster board. 4,059,870, Cl. 17-75.000.
Fire Victor Holding S.A.: *See*—
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Fireplace Corporation of America: *See*—
Lever, Paul H.; and Mohr, Clifford D., 4,060,068, Cl. 126-120.000.
Firestone Tire & Rubber Company, The: *See*—
Lohr, Delmar Frederick, Jr.; and Wakefield, Lynn Burritt, 4,060,563, Cl. 260-624.00B.
Fischer, Josef, to Neumo Armaturenfabrik-Apparatebau-Metallgieserei GmbH, Firma. Valve. 4,060,220, Cl. 251-306.000.
Fischer, Martin: *See*—
Kindscher, Wolfgang; Fischer, Martin; Eicken, Karl; and Vitt, Guenter, 4,060,522, Cl. 260-293.850.
Fischer, Rolf: *See*—
Weitz, Hans-Martin; and Fischer, Rolf, 4,060,543, Cl. 260-464.000.
Fisher, Robert C.: *See*—
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Fishman, Konstantin Evgenievich: *See*—
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Flannery, John B.: *See*—
Pollack, Joel M.; and Flannery, John B., 4,060,316, Cl. 353-20.000.
Fleer, Thomas P., to Emerson Electric Co. Manifold gas valve with stepped flow operation. 4,060,370, Cl. 431-62.000.
Fleischman, Andor A.: *See*—
Linke, Walter R.; and Fleischman, Andor A., 4,060,312, Cl. 350-189.000.
Fleissner, Hans, to Vepa AG. Apparatus for the continuous treatment of endless material, especially the shrinking thereof. 4,059,974, Cl. 68-15.000.
Fleming-Potter Company, Inc.: *See*—
Romagnoli, Robert A., 4,060,168, Cl. 206-216.000.
Floyd, Don E.; and Potente, Demetri, to General Mills Chemicals, Inc. Aminopolyamide-acrylamide-glyoxal resin. 4,060,507, Cl. 260-21.000.
Floyd, Middleton Brawner, Jr.: *See*—
Bernady, Karel Francis; Floyd, Middleton Brawner, Jr.; Poletto, John Frank; Schaub, Robert Eugene; and Weiss, Martin Joseph, 4,060,540, Cl. 260-448.80R.
Flynt, William E., to Varo, Inc. System for measuring the modulation transfer function of an optical device. 4,060,328, Cl. 356-124.000.
Foldes, Peter, to RCA Corporation. Antenna system with automatic depolarization correction. 4,060,808, Cl. 343-100.0PE.
Foley, Robert A. Fibre optics display. 4,060,722, Cl. 362-32.000.
Foller, Werner, to Gestra-KSB Vertriebsgesellschaft mbH & Co. Kommanditgesellschaft. Thermally controlled valve. 4,060,193, Cl. 236-59.000.
Ford Motor Company: *See*—
Hideg, Laszlo; and Ernest, Robert P., 4,060,058, Cl. 123-8.090.
Kaufman, Sydney M., 4,060,414, Cl. 75-246.000.
Macauley, William T., 4,060,338, Cl. 416-214.00R.
Forneris, John L.: *See*—
Barile, Conrad A.; Brill, Robert M.; Forneris, John L.; and Regh, Joseph, 4,060,427, Cl. 148-1.500.
Fors, Lars Borje Staffan: *See*—
Verner, Bo Lennart; and Fors, Lars Borje Staffan, 4,060,574, Cl. 261-77.000.
Forth Instruments Limited: *See*—
Tilley, Leslie Joseph; and Dugdale, Bernard, 4,060,734, Cl. 250-560.000.
Foseco International Limited: *See*—
Jones, Evan Thomas Richard, 4,060,406, Cl. 75-12.000.
Foster D. Snell, Inc.: *See*—
Schoenholz, Daniel; and Petersen, Arthur W., 4,060,494, Cl. 252-105.000.
Foster Grant Co., Inc.: *See*—
Smith, Stuart B., 4,060,354, Cl. 425-4.00R.
Fougea, Bernard, to Coignet S.A. Climbing scaffolding assemblies with associated shuttering. 4,060,358, Cl. 425-65.000.
Fournier, Daniel; and Bourgeois, Hugues, to Rhone-Poulenc Industries. Electrolytic cell suitable for producing alkali metal chlorates. 4,060,475, Cl. 204-270.000.
Foxboro Company, The: *See*—
Annino, Raymond; Prescott, Robert C.; Karas, Edwin L.; and Kalinoski, Richard W., 4,059,994, Cl. 73-23.100.
Frailly, Robert A., to Eaton Corporation. Method for producing self-locking fasteners. 4,060,116, Cl. 151-7.000.
Frank, Willi: *See*—
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Franke, Henry L.: *See*—
Williams, David Roth, 4,060,400, Cl. 62-162.000.
Franke, Kurt, to Siements Aktiengesellschaft. X-ray diagnostic apparatus with an automatic exposure timer. 4,060,733, Cl. 250-491.000.
Frechette, Kenneth R., to Stamford, Xerox Corporation. Ribbon lift guide. 4,060,162, Cl. 197-53.000.
Friedman, Diana W.: *See*—
Friedman, Irving, 4,060,077, Cl. 128-145.800.
Friedman, Irving, to Friedman, Diana W. Respirator. 4,060,077, Cl. 128-145.800.
Fritzsche, Christoph, to Lonza, Ltd. Process for the determination of the visco-elastic characteristics of polymers and arrangement to carry out the process. 4,059,983, Cl. 73-15.600.
Frye, Robert Charles: *See*—
Tasch, Al F., Jr; Frye, Robert Charles; Fu, Horng-Sen; and Brodersen, Robert W., 4,060,738, Cl. 307-238.000.
Fu, Horng-Sen: *See*—
Tasch, Al F., Jr; Frye, Robert Charles; Fu, Horng-Sen; and Brodersen, Robert W., 4,060,738, Cl. 307-238.000.
Fuji Chemical Industries, Ltd.: *See*—
Nakamoto, Hiromasa; Nakamoto, Shin-Ichi; Amemiya, Hidemitu; Miyamura, Souji; Shiba, Motoo; and Nakamura, Nobuko, 4,060,527, Cl. 260-279.00R.
Fuji Photo Film Co., Ltd.: *See*—
Kondo, Toshihiro, 4,060,313, Cl. 350-269.000.
Maekawa, Yukio; Satomura, Masato; and Umehara, Akira, 4,060,685, Cl. 542-413.000.
Fuji Photo Optical Co., Ltd.: *See*—
Numata, Saburo; and Fujino, Shinichiro, 4,060,788, Cl. 338-128.000.
Watanabe, Naohei; and Inoue, Tadaomi, 4,060,756, Cl. 318-668.000.
Fuji Xerox Co., Ltd.: *See*—
Suzuki, Matsumi; Morino, Tetsuro; and Yokota, Shozo, 4,060,694, Cl. 179-1.0SD.
Suzuki, Matsumi; Kataoka, Hiroyuki; and Ueno, Keiichi, 4,060,695, Cl. 179-1.0SB.

Fujie, Kunio; Nakayama, Wataru; Kuwahara, Heikichi; and Kakizaki, Kimio, to Hitachi Cable, Ltd.; and Hitachi, Ltd. Heat transfer wall for boiling liquids. 4,060,125, Cl. 165-133.000.
Fujiki, Goro: *See*—
Iwahara, Makoto; Maruyama, Fumio; Fujiki, Goro; Mori, Toshinori; Hiyama, Norio; and Kikuchi, Mitsuru, 4,060,696, Cl. 179-1.0GQ.
Fujino, Shinichiro: *See*—
Numata, Saburo; and Fujino, Shinichiro, 4,060,788, Cl. 338-128.000.
Fujita, Makio: *See*—
Shimizu, Kazufusa; Katsumori, Shigeo; Nishikawa, Tadaaki; Senoo, Keisaku; Sakamaki, Kenji; Fujita, Makio; Tano, Teruo; Takano, Hiroshi; and Komori, Hideo, 4,060,390, Cl. 23-259.100.
Fujitsu Limited: *See*—
Togei, Ryoiku; Takei, Akira; Hika, Yoshihiko; and Wada, Kunihiko, 4,060,796, Cl. 365-183.000.
Fukatsu, Shunzo: *See*—
Umezawa, Hamao; Umezawa, Sumio; Tsuchiya, Osamu; Akita, Eiichi; Miyazawa, Takeo; Horiuchi, Yukio; and Fukatsu, Shunzo, 4,060,682, Cl. 536-10.000.
Funk, Richard S.; Stewart, S. Alan; and Ruff, David L., to Grefco, Inc. Strip for fastening and sealing sheets of construction material. 4,059,933, Cl. 52-127.000.
Furuta, Koichi, to Nippon Kogaku K.K. Switch operating device operatively associated with a reciprocally movable member. 4,060,818, Cl. 354-266.000.
Futurecraft Corporation: *See*—
Piet, Meyer; and Giles, Dean Gaylord, 4,059,903, Cl. 32-40.00R.
G. D. Searle & Co.: *See*—
Collins, Paul W.; and Pappo, Raphael, 4,060,691, Cl. 560-121.000.
GAF Corporation: *See*—
Stanley, Lester N.; and Farris, Russell E., 4,060,544, Cl. 260-465.00D.
Waxman, Burton H.; and Mourning, Michael C., 4,060,418, Cl. 96-29.00D.
Gajajiva, Padej, to I-T-E Imperial Corporation Efcor Division. Swivel conduit coupling assembly. 4,060,264, Cl. 285-175.000.
Gallagher, William J.: *See*—
Mallozzi, Philip J.; Epstein, Harold M.; Applebaum, David C.; Gallagher, William J.; and Campbell, Bernerd E., 4,060,769, Cl. 330-4.300.
Gallant, Gerald G., Jr.: *See*—
LaHaye, Paul G.; Bjerklie, John W.; and Gallant, Gerald G., Jr., 4,060,379, Cl. 432-179.000.
Galvagni, John L., to AVX Corporation. Tantalum chip capacitor and method of manufacture. 4,059,887, Cl. 29-570.000.
Gamez Duch, Enrique. Soccer board game. 4,060,245, Cl. 273-85.00R.
Ganellin, Charon Robin: *See*—
Durant, Graham John; Emmett, John Colin; and Ganellin, Charon Robin, 4,060,621, Cl. 424-263.000.
Gante, Joachim; Kurmeier, Hans-Adolf; Orth, Dieter; Schacht, Erich; and Wild, Albrecht, to Merck Patent Gesellschaft mit beschrankter Haftung. Phenylalkanol nitriles. 4,060,633, Cl. 424-304.000.
Garber, Alfred; Stonner, Hans-Martin; Wiesner, Paul; Sinclair, Alan; and Schmidt, Alfred, to Metallgesellschaft Aktiengesellschaft; and Chemie Linz Aktiengesellschaft. Continuous process for recovering pure, concentrated ammonia. 4,060,591, Cl. 423-352.000.
Garcia, Federico. Slide display. 4,059,913, Cl. 40-64.00A.
Gasharov, Vihar Assenov: *See*—
Stoev, Stoycho Mitrev; Metodiev, Metodi Stoyanov; Kuzev, Lyubomir Vladimirov; Vedrichkov, Petko Georgiev; Sapunarov, Ivan Mitrev; Vassilev, Vassil Vladimirov; Dimitrov, Spas Petkov; Gasharov, Vihar Assenov; Russev, Sheko Kolev; and Mitrev, Kostadin Georgiev, 4,060,481, Cl. 209-170.000.
Gast, Gary. Liquor trunk. 4,060,156, Cl. 190-30.000.
Gausepohl, Hermann: *See*—
Naarmann, Herbert; Reichel, Fritz; and Gausepohl, Hermann, 4,060,679, Cl. 526-304.000.
Gdovin, David Paul, to Singer Company, The. Viewing head. 4,060,835, Cl. 358-238.000.
Gearin, John M., to Bunker Ramo Corporation. Hermaphroditic connector assembly. 4,060,298, Cl. 339-48.000.
Gee, James Edgar; and Ohms, Edward Joseph, to Caterpillar Tractor Co. Bearing assembly for an auger scraper. 4,060,289, Cl. 308-187.100.
Geisel, Berthold: *See*—
Credner, Karl; Geisel, Berthold; Brenner, Gunter; and Tauscher, Manfred, 4,060,617, Cl. 424-253.000.
Gemmer, Erwin: *See*—
Johannes, Gerhard; Gemmer, Erwin; Konig, Hans-Joachim; and Reinhard, Gunter, 4,060,655, Cl. 428-35.000.
General Atomic Company: *See*—
Miertschin, Gary N.; and Powell, Kenneth F., 4,060,454, Cl. 176-84.000.
General Electric Company: *See*—
Anderson, Thomas E., 4,060,751, Cl. 315-209.00R.
Cuzzone, Raymond, 4,060,786, Cl. 337-244.000.
Ellis, Delmar H., 4,060,329, Cl. 356-167.000.
Hall, Robert N., 4,060,432, Cl. 148-186.000.
Hanson, James M.; and Povall, Gerald W., 4,060,721, Cl. 362-13.000.
Harnden, John D., Jr., 4,060,783, Cl. 335-296.000.
Houston, Douglas E.; and Krishna, Surinder, 4,060,821, Cl. 357-22.000.
Loeb, Leopold, 4,059,970, Cl. 62-353.000.
McMurray, William, 4,060,757, Cl. 363-57.000.
Stein, Charles R.; and Carl, William L., 4,060,801, Cl. 340-324.00R.
Thomas, George L., 4,060,423, Cl. 106-52.000.
True, Howard D. F., Jr., 4,059,966, Cl. 62-414.000.
Walker, Loren H., 4,060,752, Cl. 315-244.000.
White, Dwain M., 4,060,514, Cl. 260-47.0ET.
General-Electro Mechanical Corporation: *See*—
Vargo, Joseph, Jr.; and Davern, John W., 4,060,189, Cl. 227-53.000.
General Foods Corporation: *See*—
Haas, Gerhard Julius; and Herman, Edwin Bernard, 4,060,602, Cl. 424-58.000.
General Mills Chemicals, Inc.: *See*—
Floyd, Don E.; and Potente, Demetri, 4,060,507, Cl. 260-21.000.
General Motors Corporation: *See*—
Beam, Paul E., Jr.; and Meyers, Charles K., 4,059,972, Cl. 64-1.00V.
Bell, Albert H., III, 4,060,337, Cl. 416-186.00R.
Chabot, Daniel H.; Peterson, Robert S.; and Plumer, Roy D., 4,060,117, Cl. 151-43.000.
Demido, Michael; and Shellhause, Ronald L., 4,060,283, Cl. 303-6.00C.
Ditto, Edwin D., 4,059,876, Cl. 29-156.70A.
Jacobs, James W., 4,059,975, Cl. 68-23.700.
General Signal Corporation: *See*—
Bogenschutz, Thomas M.; Engle, Thomas H.; and McEathron, Eugene D., 4,060,152, Cl. 188-52.000.
General Time Corporation: *See*—
Morrison, David; and Rogers, Donald J., 4,059,953, Cl. 58-4.00R.
General Tire & Rubber Company, The: *See*—
Benton, Richard E., 4,060,502, Cl. 260-2.50P.
Genjiro, Kakogawa: *See*—
Kazuo, Yamaguchi; Genjiro, Kakogawa; Masayoshi, Hasuo; Goko, Nobuaki; and Maruyama, Yasuo, 4,060,593, Cl. 423-492.000.
Gentry, Charles B.; and Phillips, William A., to Granco Equipment, Inc. Liquid or gaseous fuel fired burner. 4,060,371, Cl. 431-75.000.
George Neville Truck Equipment Limited: *See*—
Neville, George Edgar, 4,060,273, Cl. 296-100.000.
Gerber, Arthur M.; and Walworth, Vivian K., to Polaroid Corporation. Method of forming silver halide grains by electrolysis. 4,060,419, Cl. 96-94.00R.
Gerber Garment Technology, Inc.: *See*—
Gerber, Heinz Joseph, 4,060,016, Cl. 83-451.000.
Gerber, Heinz Joseph, to Gerber Garment Technology, Inc. Method and apparatus for blanking out pattern pieces from a layup. 4,060,016, Cl. 83-451.000.
Gerhard, Helmut, to Westerwalder Eisenwerk Gerhard KG. Self-contained double-tubular transport container. 4,060,174, Cl. 220-23.400.
Germscheid, Hans-Gunther: *See*—
Blaser, Bruno; Germscheid, Hans-Gunther; and Worms, Karl-Heinz, 4,060,546, Cl. 260-502.40A.
Gerstman, Richard B.: *See*—
Feldeisen, Ronald F.; Minchak, John A.; Gerstman, Richard B.; Meyers, Herbert M.; and Edstrom, Richard C., 4,060,105, Cl. 141-1.000.
Gesellschaft fur Biotechnologische Forschung mbH, (GBF): *See*—
Wagner, Fritz; Sahm, Hermann; and Keune, Walter Hartmut, 4,060,455, Cl. 195-29.000.
Gesellschaft fur Elektronische Rohren Comet Bern: *See*—
Rissi, Walter, 4,060,731, Cl. 250-402.000.
Gestra-KSB Vertriebsgesellschaft mbH & Co. Kommanditgesellschaft: *See*—
Foller, Werner, 4,060,193, Cl. 236-59.000.
Gewerkschaft Eisenhutte Westfalia: *See*—
Stuckmann, Dieter, 4,059,965, Cl. 61-105.000.
Ghyczy, Miklos: *See*—
Asinger, Friedrich; Offermanns, Heribert; and Ghyczy, Miklos, 4,060,548, Cl. 260-534.00S.
Giacosa, Dante, to Sira Societa' Industriale Richerche Automotoristiche. Stepless speed change gear for motor propulsion systems of motor vehicles. 4,060,012, Cl. 74-689.000.
Gibson, David Kent, to International Business Machines Corporation. Controlled slip paper separator. 4,060,232, Cl. 271-122.000.
Gibson, Michael H.: *See*—
Hass, Robert H.; and Gibson, Michael H., 4,060,589, Cl. 423-244.000.
Gilbrech, Donald A. Banjo drumhead. 4,060,018, Cl. 84-269.000.
Giles, Dean Gaylord: *See*—
Piet, Meyer; and Giles, Dean Gaylord, 4,059,903, Cl. 32-40.00R.
Gimbel, Jurgen: *See*—
Scholz, Hansjurgen; Backhaus, Hans-Gerd; Brambilla, Luigi; and Gimbel, Jurgen, 4,060,004, Cl. 73-514.000.
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Tirabassi, Tiziano; Giovanelli, Giorgio; Cesari, Giulio; Bonafe, Ubaldo; and Antisari, Ottavio Vittori, 4,060,326, Cl. 356-96.000.
Girdler, George W., to Steinberg, Jack, a part interest. Tie clasp. 4,059,853, Cl. 2-152.00A.
Gireau, Jean: *See*—
Risler, Pierre; Gireau, Jean; Rose, Pierre; and Bisson, Jean-Pierre, 4,060,645, Cl. 426-302.000.
Girling Limited: *See*—
Smith, George Windsor, 4,060,154, Cl. 188-73.300.
Giuffre, Luigi; de Nora, Vittorio; and Spaziante, Placido, to Oronzio de Nora Impianti Elettrochimici S.p.A. Novel copolymers and diaphragms made therefrom. 4,060,473, Cl. 204-253.000.
Gleason, Thomas G. Scrubber-cooler tower. 4,060,399, Cl. 55-244.000.
Glory Kogyo Kabushiki Kaisha: *See*—
Douno, Syugo, 4,060,093, Cl. 133-1.00A.

Glover, Douglas; and Minter, Marvin J., to Federal-Mogul Corporation. Materials hardness testing device. 4,059,990, Cl. 73-81.000.
Godin, Paul: *See*—
Mascarello, Jean Marius; Godin, Paul; and Millet, Jacques Francois, 4,060,466, Cl. 204-129.000.
Goebel, Franz, to GTE Laboratories Incorporated. Primary electrochemical cell. 4,060,668, Cl. 429-122.000.
Goko, Nobuaki: *See*—
Kazuo, Yamaguchi; Genjiro, Kakogawa; Masayoshi, Hasuo; Goko, Nobuaki; and Maruyama, Yasuo, 4,060,593, Cl. 423-492.000.
Golay, Marcel J. E., to Perkin-Elmer Corporation, The. Analysis of images. 4,060,713, Cl. 364-416.000.
Gold Lode, Inc.: *See*—
Thompson, Arnold M., 4,060,013, Cl. 76-83.000.
Gold Thread Machinery Co.: *See*—
Landgraf, Glenn A.; and Ebel, Fred H., 4,060,227, Cl. 270-66.000.
Goldmann, Wolf: *See*—
Weber, Paul; Mollenkopf, Hans; Henning, Kurt; Heinemann, Otto; Schmits, Heinz-Herbert; Rother, Wolfgang; Ritzmann, Horst; Wurr, Jurgen; Krutzner, Karl, Jr.; Schossler, Werner; Goldmann, Wolf; and Schepers, Georg, 4,060,375, Cl. 432-14.000.
Goldsby, Claude W.; and Sandau, Roray J. Heat extractor for stoves. 4,060,196, Cl. 237-51.000.
Gomaa, Ezzat E.; and Young, Roger E., to Chevron Research Company. Method of improving a steam drive. 4,060,129, Cl. 166-252.000.
Gonzalez-Camino nee Bertin, Francoise: *See*—
Guienne, Paul; Herrouin, Guy; Lafont, Andre; Bertin, Jean, deceased; Bertin, Michel; Bertin, Laurent; Bertin, Philippe; Midy nee Bertin, Catherine; Gonzalez-Camino nee Bertin, Francoise; and Bertin nee Loustau, Genevieve, heirs, 4,060,147, Cl. 180-121.000.
Goodman Manufacturing Corporation: *See*—
Deck, Arthur M., 4,060,024, Cl. 98-40.0VM.
Goodyear Tire & Rubber Company, The: *See*—
Castner, Kenneth F., 4,060,468, Cl. 204-158.00R.
Feeney, George W.; and Habeck, Bruce W., 4,060,503, Cl. 260-5.000.
Halsey, George H., 4,059,989, Cl. 73-598.000.
Houck, Staley J.; and Smith, Michael W., 4,060,445, Cl. 156-414.000.
Parker, Dane K., 4,060,556, Cl. 260-590.00R.
Sinclair, Richard G.; and Cremeans, George E., 4,060,511, Cl. 260-34.200.
Tazuma, James J.; and Bergomi, Angelo, 4,060,567, Cl. 260-681.50C.
Gordon, Philip L.: *See*—
Yannas, Ioannis V.; Burke, John F.; Gordon, Philip L.; and Huang, Chor, 4,060,081, Cl. 128-156.000.
Goscenski, Edward J., Jr., to Eaton Corporation. Power steering mechanism. 4,060,146, Cl. 180-161.000.
Gosney, William Milton, to Texas Instruments Incorporated. Charge coupled device shift registers having an improved regenerative charge detector. 4,060,737, Cl. 307-221.00D.
Goss, Alan Jerome: *See*—
Howorth, Jonathan Ross; Goss, Alan Jerome; and Pool, Peter James, 4,060,823, Cl. 357-30.000.
Goto, Hideo; Shibamoto, Nobuyori; and Tanaka, Shunsaku, to Sugai Chemical Industry Co., Ltd. Process for preparing O-phenylphenol. 4,060,559, Cl. 260-620.000.
Goto, Mituhiro; Hashimoto, Isao; Watanabe, Shugo; and Itabashi, Koji, to Mamiya Koki Kabushiki Kaisha. Precipitation-hardenable, nitrided aluminum alloys and nitrided mother alloys therefor. 4,060,411, Cl. 75-138.000.
Graham, Robert E. Retractable anchors for game bases. 4,060,244, Cl. 273-25.000.
Granco Equipment, Inc.: *See*—
Gentry, Charles B.; and Phillips, William A., 4,060,371, Cl. 431-75.000.
Grant, Graham Cameron. Method and apparatus for vapor saturated gas delivery. 4,060,576, Cl. 261-130.000.
Granzow, Clarence E. Grinding mill. 4,060,206, Cl. 241-259.100.
Gras, Elie, to Societe Immobiliere et Financiere Suchet Alfort (S.I.F.-S.A.). Apparatus for fabricating molded articles using high-frequency heating. 4,060,364, Cl. 425-174.000.
Grasselli, Robert K.: *See*—
Miller, Arthur F.; Zagata, Robert J.; and Grasselli, Robert K., 4,060,545, Cl. 560-208.000.
Grataloup, Xavier Roger, to Nodet-Gougis (Societe de droit francais). Method and apparatus for controlling the transfer of particulate material. 4,060,181, Cl. 222-193.000.
Graves, Toby R.: *See*—
Woods, John Henry; and Graves, Toby R., 4,060,569, Cl. 260-683.15R.
Grebe, Herbert; Hartwig, Wolfgang; Kohler, Johann; Rothe, Rudolf; and Schroder, Karl-Friedrich, to HAG Aktiengesellschaft. Bottom closure for a chemical reactor. 4,060,394, Cl. 23-284.000.
Green, Joseph, to H. J. Heinz Company Limited. Heat treating particulate material. 4,059,919, Cl. 47-1.100.
Green, Kenneth A.: *See*—
Hefni, Ibrahim El; Green, Kenneth A.; and Cloutier, Donald C., 4,060,778, Cl. 333-73.00W.
Green, Mino, to Imperial Chemical Industries Limited. Electrochromic device. 4,060,311, Cl. 350-160.00R.
Greene, Leonard M., to Safe Flight Instrument Corporation. System for monitoring water flow angle relative to a boat keel. 4,059,993, Cl. 73-178.00R.
Grefco, Inc.: *See*—
Funk, Richard S.; Stewart, S. Alan; and Ruff, David L., 4,059,933, Cl. 52-127.000.
Gregory, Gordon Ian: *See*—
Bradshaw, Janice; Cook, Martin Christopher; and Gregory, Gordon Ian, 4,060,686, Cl. 544-22.000.
Gresillon, Robert, to Prenihan AG. Circular knit lower body garment and method of manufacture. 4,059,973, Cl. 66-177.000.
Grieben, Karl-Heinz: *See*—
Menge, Gunter; Grieben, Karl-Heinz; Reitmeier, Lutz; and Frank, Willi, 4,059,940, Cl. 53-148.000.
Grier, Nathaniel: *See*—
Jacobus, David P.; Dulaney, Eugene L.; and Grier, Nathaniel, 4,060,639, Cl. 424-325.000.
Gritz, Robert W.: *See*—
Poliak, John M.; Lopez, Juan M.; and Gritz, Robert W., 4,060,305, Cl. 339-269.000.
Grob, Jean, to J. Bobst & Fils, S.A. Process and apparatus for permanently controlling the movement of web of material continuously delivered to a machine processing the web. 4,060,187, Cl. 226-8.000.
Groppenbacher, Gregor; Rieckmann, Peter; and Rothe, Werner, to Boehringer Mannheim G.m.b.H. Tablets coated with aqueous resin dispersions. 4,060,598, Cl. 424-33.000.
Gros, Chajim. Apparatus and method for manufacturing resilient bands. 4,060,015, Cl. 83-19.000.
Gross, Dario R.: *See*—
Yanik, LeRoy; and Gross, Dario R., 4,060,340, Cl. 417-28.000.
Grosse-Plankermann, Wilhelm, to Hauck GmbH. Laboratory clock. 4,059,954, Cl. 58-21.130.
Grotepass, Johann: *See*—
Wilson, Norman A.; and Grotepass, Johann, 4,060,428, Cl. 148-12.00R.
Groves, James D.; and Loffredo, Stefano, to Minnesota Mining and Manufacturing Company. Electrically insulating composition. 4,060,583, Cl. 264-272.000.
Gruber, Johann: *See*—
Russer, Peter; and Gruber, Johann, 4,060,739, Cl. 307-319.000.
Grundler, Robert; and Jenny, Hubert, to Aktiengesellschaft Adolph Saurer. Brakeshoe for shuttle brakes of looms. 4,060,103, Cl. 139-185.000.
Grunsky, Manfred: *See*—
Holloway, William Stuart; and Grunsky, Manfred, 4,060,335, Cl. 408-233.000.
Grzhimalovsky, Alexandr Sergeevich: *See*—
Egorov, Boris Afanasievich; Grzhimalovsky, Alexandr Sergeevich; Judin, Alexandr Vladimirovich; Fishman, Konstantin Evgenievich; and Vernaya, Ljudmila Dmitrievna, 4,060,582, Cl. 264-210.00F.
GTE Laboratories Incorporated: *See*—
Goebel, Franz, 4,060,668, Cl. 429-122.000.
GTE Sylvania Incorporated: *See*—
Jayne, Max L.; and Natale, Paul R., 4,060,300, Cl. 339-74.00R.
Guienne, Paul; Herrouin, Guy; Lafont, Andre; Bertin, Jean, deceased; by Bertin, Michel; by Bertin, Laurent; by Bertin, Philippe; by Midy nee Bertin, Catherine; by Gonzalez-Camino nee Bertin, Francoise; and by Bertin nee Loustau, Genevieve, heirs, to Bertin & Cie; and Societe d'Etudes et de Developpement des Aeroglisseurs Marins, Terrestres et Amphibies S.E.D.A.M. Vehicles riding on air cushions. 4,060,147, Cl. 180-121.000.
Guillaumont, Jacques: *See*—
Masure, Daniel; Guillaumont, Jacques; and Pigeaud, Jean-Marie, 4,060,474, Cl. 204-270.000.
Gustafsson, Hans Hjalmar. Pallet. 4,060,037, Cl. 108-51.100.
Gwaltney, Robert E.; and Mikovits, John L., to Bada Company, Inc. Sprue removal mechanism for die casting apparatus. 4,060,121, Cl. 164-262.000.
H. A. Phillips & Co.: *See*—
Ross, Robert R., 4,059,968, Cl. 62-174.000.
H. J. Heinz Company Limited: *See*—
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Haag, Franz: *See*—
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Haas, Gerhard Julius; and Herman, Edwin Bernard, to General Foods Corporation. Oral preparations for preventing dental caries. 4,060,602, Cl. 424-58.000.
Haas, Karl-Heinz: *See*—
Rapp, Wolfgang; Haas, Karl-Heinz; and Luessem, Heribert, 4,060,388, Cl. 23-230.00R.
Habeck, Bruce W.: *See*—
Feeney, George W.; and Habeck, Bruce W., 4,060,503, Cl. 260-5.000.
Habermeier, Juergen: *See*—
Batzer, Hans; Habermeier, Juergen; and Porret, Daniel, 4,060,525, Cl. 260-260.000.
Habersang, Silke: *See*—
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Hadley, James C.: *See*—
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HAG Aktiengesellschaft: *See*—
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Hague International: *See*—
LaHaye, Paul G.; Bjerklie, John W.; and Gallant, Gerald G., Jr., 4,060,379, Cl. 432-179.000.

Hahn, Paul-Jurgen: *See*—
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Haishi, Yuichiro: *See*—
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Hall, Robert N., to General Electric Co. Method for manufacturing nuclear radiation detector with deep diffused junction. 4,060,432, Cl. 148-186.000.

Haller, Fritz, to U. Scharer Sohne AG, (USM). Steel girder. 4,059,937, Cl. 52-693.000.

Halliburton Company: *See*—
Barrington, Burchus Q., 4,060,140, Cl. 175-7.000.

Halsey, George H., to Goodyear Tire & Rubber Company, The. Nondestructive examination of an article particularly a tire, with ultrasonic energy. 4,059,989, Cl. 73-598.000.

Halter, Jerome Barth, to RCA Corporation. Wideband electromechanical recording system. 4,060,831, Cl. 358-128.000.

Hamlin, Thomas J.: *See*—
Stange, Klaus K.; and Hamlin, Thomas J., 4,060,233, Cl. 271-160.000.

Hammond, Donald J.: *See*—
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Hanke, Kenneth Earl; and Rees, Ned, to Kearney-National Inc. Enclosing structure for a high voltage electric fuse. 4,060,785, Cl. 337-201.000.

Hannes Marker: *See*—
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Hans, Waldemar: *See*—
Brune, Gerhard; and Hans, Waldemar, 4,060,199, Cl. 239-488.000.

Hansen, M. James. Collapsible table. 4,060,275, Cl. 297-159.000.

Hansford, Reginald Frederick, to Decca Limited. Projection apparatus. 4,060,318, Cl. 353-42.000.

Hanson, Charles G. Power supply control. 4,060,709, Cl. 219-131.00R.

Hanson, James M.; and Povall, Gerald W., to General Electric Company. Photoflash lamp array having conductive reflector. 4,060,721, Cl. 362-13.000.

Hanson, Raymond L. Pill gun. 4,060,083, Cl. 128-223.000.

Harada, Kenji: *See*—
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Harada, Yutaka; Itai, Noriyuki; Ucikawa, Hiroshi; Kato, Hajime; Sato, Katutoshi; and Itoh, Akira, to Japanese National Railways; Onoda Cement Company Limited; and Nichireki Chemical Industry Company Limited. Super rapid hardening mixture. 4,060,425, Cl. 106-90.000.

Harbridge, John Barry: *See*—
Howarth, Thomas Trefor; and Harbridge, John Barry, 4,060,530, Cl. 260-307.0FA.

Harmon, Edward J.: *See*—
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Harmon, James F.: *See*—
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Harnden, John D., Jr., to General Electric Co. Magnetic circuit and method of making. 4,060,783, Cl. 335-296.000.

Harp, Marlyn F.: *See*—
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Harris, Nicholas D., to Morton-Norwich Products, Inc. Vinylbenzyl esters of n-boc-amino acids. 4,060,689, Cl. 560-29.000.

Hart, Joseph I., to Texaco Trinidad, Inc. Cleanout procedure for well with low bottom hole pressure. 4,060,130, Cl. 166-312.000.

Harter, Donald Gerton, to Solar Industries, Inc. Solar heating. 4,060,070, Cl. 126-271.000.

Hartig, Arnold: *See*—
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Hartman, Milton D.: *See*—
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Hartmann, Achim; Kulling, Achim; and Thumm, Hans, to Kronos Titan G.m.b.H. Process for recovery of iron oxide and chlorine from dust produced in chlorination of titaniferous ores. 4,060,584, Cl. 423-149.000.

Hartmann, Ludwig A., to ICI United States Inc. Halogenated dioxolane tranquilizers. 4,060,532, Cl. 260-340.90R.

Hartness, Robert G.: *See*—
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Hartness, Thomas P.; and Hartness, Robert G. Container separator. 4,060,166, Cl. 198-446.000.

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Grebe, Herbert; Hartwig, Wolfgang; Kohler, Johann; Rothe, Rudolf; and Schroder, Karl-Friedrich, 4,060,394, Cl. 23-284.000.

Harumiya, Akinori; and Toyosawa, Koki, to Hitachi, Ltd. Scanning system. 4,060,795, Cl. 364-900.000.

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Hata, Masaaki; and Wada, Sotaro, to Tokyo Shibaura Electric Co., Ltd. Frequency modulation system. 4,060,773, Cl. 332-19.000.

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Hauck GmbH: *See*—
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Menge, Gunter; Grieben, Karl-Heinz; Reitmeier, Lutz; and Frank, Willi, 4,059,940, Cl. 53-148.000.

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Hay, Jean-Yves: *See*—
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Hayamizu, Seiji, to Senoh Kabushiki Kaisha. Arrangement for fastening an upstanding post to a floorboard. 4,059,934, Cl. 52-297.000.

Haynes, George R.: *See*—
Kodama, Jiro K.; Haynes, George R.; and Albert, James R., 4,060,640, Cl. 424-326.000.

Hays, Ray L.: *See*—
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Heden, Bjorn Harald. Reduction gear, especially for camera lens motors. 4,060,010, Cl. 74-798.000.

Hefni, Ibrahim El; Green, Kenneth A.; and Cloutier, Donald C., to Microwave Research Corporation. Microwave harmonic absorption filter. 4,060,778, Cl. 333-73.00W.

Hegel, Edward. Friction type exercising device. 4,060,241, Cl. 272-132.000.

Heil, Eduard: *See*—
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Heine, Helmut A.; Schmidt, Otto H.; and Rosenbusch, Helmut W., to Propper Manufacturing Company, Inc.; and Optotechnik Heine KG. Mounting apparatus for optical examination devices connected to a projector through a light-conducting cable. 4,060,724, Cl. 362-32.000.

Heinemann, Helmut: *See*—
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Heinemann, Otto: *See*—
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Heinz, Theodore A., to Rockwell International Corporation. Two axes remote mirror mount. 4,060,314, Cl. 350-285.000.

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Heklowski, Florian; and Nicholas, William, to Heklowski, Florian. Automotive engine exhaust — clean air system. 4,059,958, Cl. 60-614.000.

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Hendrickson, Vergil Philip; and Cole, Carroll Richard, to Caterpillar Tractor Co. Motor grader blade mounting and tilt mechanism. 4,060,136, Cl. 172-795.000.

Hendy, Brian Norman, to Imperial Chemical Industries Limited. Production of acrylonitrile copolymers. 4,060,680, Cl. 526-201.000.

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Henning, Kurt: *See*—
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Hentz, LeRoy Richard; Pavlovic, Gary Frank; Scarafino, Angelo James; and Seksinsky, John Joseph, to International Business Machines Corporation. Temperature monitoring furnace. 4,060,377, Cl. 432-50.000.

Herbst, Donald. Pipe construction. 4,060,265, Cl. 285-405.000.

Herman, Edwin Bernard: *See*—
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Heyraud, Marc, to Portescap. Electric direct current rotating machine. 4,060,746, Cl. 310-177.000.
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Hika, Yoshihiko: *See—*
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Hildebrand, Larry R.; and Pausinger, Siegfried K., to Packaging Corporation of America. Foldable container. 4,060,169, Cl. 206-289.000.
Hillstrom, Thomas P., to International Harvester Company. Control mechanism. 4,060,157, Cl. 192-4.00A.
Hiltebrandt, Siegfried; and Bonnet, Ludwig, to Richard Wolf GmbH. Single or double-shank cutting loop device for resectoscopes. 4,060,087, Cl. 128-303.150.
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Hirasawa, Koichi, to Toyota Jidosha Kogyo Kabushiki Kaisha. Throttle positioner. 4,060,063, Cl. 123-97.00B.
Hirayama, Kazuhiro; Sato, Yasushi; Tokiwa, Taisuke; Kawakubo, Kazuo; Iwatate, Fujio; and Nakatsui, Hisashi, to Canon Kabushiki Kaisha. Image information handling device. 4,060,322, Cl. 355-60.000.
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Hirschkoff, Sidney, to McCulloch Corporation. Full position safety brake for portable chain saw. 4,059,895, Cl. 30-382.000.
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Hoffman, Gerald F.; and Bolton, Dewayne P., to Fabri-Tek Incorporated. Energy saving temperature control apparatus. 4,060,123, Cl. 165-11.000.
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Holloway, David John, to USM Corporation. Blind riveting tools. 4,059,981, Cl. 72-391.000.
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Hollymatic Corporation: *See—*
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Hoover, Fred Wayne; and Iler, Ralph K., to Du Pont de Nemours, E. I., and Company. Particulate membrane ultrafiltration device. 4,060,488, Cl. 210-433.00M.
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Houston, Douglas E.; and Krishna, Surinder, to General Electric Co. Field controlled thyristor with buried grid. 4,060,821, Cl. 357-22.000.
Howarth, Thomas Trefor; and Harbridge, John Barry, to Beecham Group Limited. Clavulanic acid amides. 4,060,530, Cl. 260-307.0FA.
Howorth, Jonathan Ross; Goss, Alan Jerome; and Pool, Peter James, to English Electric Valve Company Limited. Electron-emissive semiconductor devices. 4,060,823, Cl. 357-30.000.
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Hutson, Jearld L. Slow speed semiconductor switching device. 4,060,824, Cl. 357-37.000.
Hyatt, Gilbert Peter. Electronic calculator system having audio messages for operator interaction. 4,060,848, Cl. 364-200.000.
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Iizuka, Masahiko; Suzuki, Jiro; and Kobayashi, Sigeyasu, to Kojima, Ichiro. Apparatus for growing animal cells. 4,060,457, Cl. 195-127.000.
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Harada, Yutaka; Itai, Noriyuki; Ucikawa, Hiroshi; Kato, Hajime; Sato, Katutoshi; and Itoh, Akira, 4,060,425, Cl. 106-90.000.
Itaya, Kenji: *See—*
Yokota, Noriyuki; Tokuda, Shingo; Ito, Yoshiro; and Itaya, Kenji, 4,060,465, Cl. 204-128.000.
Ito, Michio: *See—*
Takahashi, Shigeo; Ito, Michio; Nagasawa, Sakae; and Suzuki, Sigeo, 4,060,120, Cl. 164-35.000.
Ito, Shozo, to Mifuji Iron Works Co., Ltd. Apparatus for treating raw material with a treating gas. 4,060,393, Cl. 23-277.00R.
Ito, Yoshiro: *See—*
Yokota, Noriyuki; Tokuda, Shingo; Ito, Yoshiro; and Itaya, Kenji, 4,060,465, Cl. 204-128.000.
Itoh, Akira: *See—*
Harada, Yutaka; Itai, Noriyuki; Ucikawa, Hiroshi; Kato, Hajime; Sato, Katutoshi; and Itoh, Akira, 4,060,425, Cl. 106-90.000.
ITW Fastex Italia, S.p.A.: *See—*
Aimar, Michele, 4,059,938, Cl. 52-716.000.
Iwahara, Makoto; Maruyama, Fumio; Fujiki, Goro; Mori, Toshinori; Hiyama, Norio; and Kikuchi, Mitsuru, to Victor Company of Japan, Limited. Binaural four-channel stereophony. 4,060,696, Cl. 179-1.0GQ.
Iwami, Isamu; and Kinoshita, Hideo, to Asahi-Dow Limited. Coating compositions. 4,060,657, Cl. 428-375.000.
Iwatate, Fujio: *See—*
Hirayama, Kazuhiro; Sato, Yasushi; Tokiwa, Taisuke; Kawakubo, Kazuo; Iwatate, Fujio; and Nakatsui, Hisashi, 4,060,322, Cl. 355-60.000.
Hirayama, Kazuhiro; Sato, Yasushi; Tokiwa, Taisuke; Iwatate, Fujio; Kawakubo, Kazuo; and Nakatsui, Hisashi, 4,060,323, Cl. 355-60.000.
J. Bobst & Fils, S.A.: *See—*
Grob, Jean, 4,060,187, Cl. 226-8.000.
Jack, James, deceased: *See—*
Taylor-Brown, Terence John; Calver, Paul Newton; and Jack, James, deceased, 4,060,648, Cl. 427-32.000.
Jack, Margaret, administratrix: *See—*
Taylor-Brown, Terence John; Calver, Paul Newton; and Jack, James, deceased, 4,060,648, Cl. 427-32.000.
Jackman, Joseph R., to Reactive Metals & Alloys Corporation. Methods and apparatus for adding mischmetal to molten steel. 4,060,407, Cl. 75-58.000.
Jackson, Byron L.; and Wagner, Joseph P., to Robertshaw Controls Company. Method of making a condition responsive valve construction. 4,059,878, Cl. 29-157.10R.
Jacobowitz, Lawrence; Mathisen, Einar S.; and Thorp, Lawrence D., to International Business Machines Corporation. Wide band grating spectrometer. 4,060,327, Cl. 356-96.000.
Jacobs, James W., to General Motors Corporation. Belt-driven transfer arm clutch mechanism for agitator washer. 4,059,975, Cl. 68-23.700.
Jacobsen, Kim. Spline and groove connection. 4,060,332, Cl. 403-359.000.
Jacobus, David P.; Dulaney, Eugene L.; and Grier, Nathaniel, to Merck & Co., Inc. Broad spectrum antibacterial compositions containing tris-(hydroxymethyl)-aminoethane and dicycloaliphatic-alkyl polyamines. 4,060,639, Cl. 424-325.000.
Jaffe, Joseph: *See—*
Reed, Marion G.; and Jaffe, Joseph, 4,060,480, Cl. 208-111.000.
James, Brian George, to Beecham Group Limited. 3-Carbamylbenzyl-7-(phenylglycyl)amino cephalosporin derivatives. 4,060,611, Cl. 424-246.000.
Janssen, Paul Adriaan Jan; Van Daele, Georges Henri Paul; and Boey, Jozef Martin, to Janssen Pharmaceutica N.V. Aroyl-substituted phenylmalonic acid derivatives. 4,060,528, Cl. 260-295.00R.
Janssen Pharmaceutica N.V.: *See—*
Janssen, Paul Adriaan Jan; Van Daele, Georges Henri Paul; and Boey, Jozef Martin, 4,060,528, Cl. 260-295.00R.
Jantsch, Ottomar; Feigt, Ingmar; and Willig, Wolf Rudiger, to Siemens Aktiengesellschaft. Strip type radiation detector and method of making same. 4,060,822, Cl. 357-30.000.
Japan Crown Cork Co., Ltd.: *See—*
Ohmi, Hidehiko, 4,060,053, Cl. 118-215.000.
Japanese National Railways: *See—*
Harada, Yutaka; Itai, Noriyuki; Ucikawa, Hiroshi; Kato, Hajime; Sato, Katutoshi; and Itoh, Akira, 4,060,425, Cl. 106-90.000.
Jardin, Hans: *See—*
Bienert, Horst; Jardin, Hans; and Schatzler, Walter, 4,060,274, Cl. 296-137.00G.

Jarreau, Francois-Xavier; and Sarfati, Roger Gerard, to Etablissements Nativelle S.A. Cardenclide derivatives. 4,060,607, Cl. 424-241.000.

Jarret, Boaz Antony, to Cav Limited. Liquid fuel pumping apparatus. 4,060,347, Cl. 417-392.000.

Jayne, Max L.; and Natalc, Paul R., to GTE Sylvania Incorporated. Longitudinally actuated zero force connector. 4,060,300, Cl. 339-74.00R.

Jennemann, Glenn A.: *See—*
Weston, Paul George; Jennemann, Glenn A.; and Hutchinson, Thomas Kemp, 4,060,108, Cl. 141-59.000.

Jenny, Damian Johann, to Damian J. Jenny AG. Apparatus for applying ingredients. 4,060,027, Cl. 99-450.100.

Jenny, Hubert: *See—*
Grundler, Robert; and Jenny, Hubert, 4,060,103, Cl. 139-185.000.

Jensen, James Keith: *See—*
Trimble, David Lee; Copley, Russell Dean; Jensen, James Keith; and Schlueter, Francis Edward, 4,059,942, Cl. 56-30.000.

Jensen, Wayne E., to B & J Manufacturing Company. Tire rasp blades with renewable cutting and buffing edges. 4,059,875, Cl. 29-78.000.

Jeserich, Wolfgang-Dieter; Cordes, Claus; Seydl, Wolfgang; and Weiss, Hans-Peter, to BASF Aktiengesellschaft. Manufacture of polyamide film-forming materials containing magnesium silicate. 4,060,518, Cl. 260-78.00L.

Jirkovsky, Ivo L.: *See—*
Philipp, Adolf H.; and Jirkovsky, Ivo L., 4,060,619, Cl. 424-256.000.

Johannes, Gerhard; Gemmer, Erwin; Konig, Hans-Joachim; and Reinhard, Gunter, to Hoechst Aktiengesellschaft. Resin coated metal substrates. 4,060,655, Cl. 428-35.000.

Johansson, Sven Olof G. Tube perforator. 4,060,366, Cl. 425-290.000.

Johnson, Charles A., to Home Curtain Corporation. Process for imparting color on a discrete basis to the thermally fused portion of quilted synthetic resinous materials. 4,060,438, Cl. 156-73.100.

Johnson Controls, Inc.: *See—*
Pascucci, Gregory A.; Krishnaiyer, Ramesh; and Pridemore, Donald Floyd, 4,060,735, Cl. 307-3.000.

Johnson, Donald F., to American Solar Energy Corporation. Solar heater apparatus. 4,060,072, Cl. 126-271.000.

Johnson, Robert B.: *See—*
Feldman, Paul S.; Johnson, Robert B.; and Nibby, Chester M., Jr., 4,060,794, Cl. 364-900.000.

Johnssen, Friedrich Karl. Antitheft system for sales areas. 4,060,040, Cl. 109-40.000.

Jonas, Rochus: *See—*
Schacht, Erich; Mehrhof, Werner; Jonas, Rochus; Nowak, Herbert; and Simane, Zdenek, 4,060,609, Cl. 424-244.000.

Jonas Woodhead Limited: *See—*
Duckett, William Arthur, 4,060,155, Cl. 188-282.000.

Jones, Charles H.; and Skinner, Dale D., to Westinghouse Electric Corporation. Imaging system. 4,060,791, Cl. 340-3.00C.

Jones, Clive, to Chrysler United Kingdom Limited. Engine mountings. 4,060,011, Cl. 74-498.000.

Jones, Donald H., to Control Systems Research, Inc. Two-speed resolver employing differential reduction techniques. 4,060,799, Cl. 340-198.000.

Jones, Evan Thomas Richard, to Foseco International Limited. Arc steelmaking. 4,060,406, Cl. 75-12.000.

Jones, James J., to Texas Instruments Incorporated. Brake control logic circuit for vehicle skid control brake system. 4,060,285, Cl. 303-106.000.

Jonson, Ake: *See—*
Trolle, Sten; and Jonson, Ake, 4,060,359, Cl. 425-78.000.

Joy Manufacturing Company: *See—*
Turner, John W., Jr., 4,060,014, Cl. 81-57.200.
Wayment, William Ross, 4,059,963, Cl. 61-35.000.

Judin, Alexandr Vladimirovich: *See—*
Egorov, Boris Afanasievich; Grzhimalovsky, Alexandr Sergeevich; Judin, Alexandr Vladimirovich; Fishman, Konstantin Evgenievich; and Vernaya, Ljudmila Dmitrievna, 4,060,582, Cl. 264-210.00F.

Jungkind, Roland; and Sedlmair, Gerhard, to Hannes Marker. Heel retainer for safety ski-bindings. 4,060,257, Cl. 280-626.000.

Junk, Norman M.: *See—*
Postupack, Constantine; Borg, David G.; Junk, Norman M.; Oswald, Gerald L.; and Bowman, Arthur F., 4,060,033, Cl. 102-24.00R.

Kabushiki Kaisha Komatsu Seisakusho: *See—*
Matsumoto, Takeshi; Chiba, Kazukiyo; Shioyama, Atsuo; and Yamaguchi, Yoshitake, 4,060,143, Cl. 180-64.00A.

Kabushiki Kaisha Ricoh: *See—*
Ohta, Wasaburo; and Watanabe, Tatsuya, 4,060,441, Cl. 156-234.000.

Kabushiki Kaisha Toyoda Jidoshokki Seisakusho: *See—*
Miyazaki, Tsutomu; Yoshida, Yoshiaki; Ueda, Shozo; Mitsuya, Kinpei; and Ogasawara, Takeshi, 4,060,207, Cl. 242-18.00R.

Kadner, Martin: *See—*
Huschka, Hans; and Kadner, Martin, 4,060,497, Cl. 252-301.10S.

Kaestner, Erwin. Bio-rhythm calculator. 4,059,952, Cl. 58-4.00R.

Kakizaki, Kimio: *See—*
Fujie, Kunio; Nakayama, Wataru; Kuwahara, Heikichi; and Kakizaki, Kimio, 4,060,125, Cl. 165-133.000.

Kalinoski, Richard W.: *See—*
Annino, Raymond; Prescott, Robert C.; Karas, Edwin L.; and Kalinoski, Richard W., 4,059,994, Cl. 73-23.100.

Kamatics Corporation: *See—*
Orkin, Stanley S., 4,060,287, Cl. 308-72.000.

Kamino, Hideo: *See—*
Minami, Hidehiro; and Kamino, Hideo, 4,060,064, Cl. 123-119.0EC.

Kampert, William P., to Aluminum Company of America. Color anodizing of aluminum. 4,060,462, Cl. 204-58.000.

Kanemaru, Muneaki; Kimura, Tetsuo; Ishii, Norimichi; and Kawashima, Hideo, to Mitsui Toatsu Chemicals, Incorporated. Process for preparing alcohols. 4,060,564, Cl. 260-641.000.

Kanojia, Ramesh M., to Ortho Pharmaceutical Corporation. Isolation of utero-evacuant substances from plant extracts. 4,060,604, Cl. 424-195.000.

Kansai Paint Company, Limited: *See—*
Sato, Hidetaka, 4,059,904, Cl. 33-126.70A.

Kaporovich, Vladimir Georgievich; Udovenko, Vitaly Kirillovich; Krasnorutsky, Viktor Petrovich; and Chechenets, Akhmet Galievich. Method of producing hermetically sealed end in a tubular workpiece. 4,059,977, Cl. 72-69.000.

Kapps, Manfred; Mitschke, Karl-Heinz; and Schliebs, Reinhard, to Bayer Aktiengesellschaft. Production of N,N-Bis-(2-hydroxyalkyl)-aminomethane phosphonic acid dialkyl esters. 4,060,571, Cl. 260-970.000.

Karami, Hamzeh, to Colgate-Palmolive Company. Diaper tape fastener. 4,060,085, Cl. 128-287.000.

Karas, Edwin L.: *See—*
Annino, Raymond; Prescott, Robert C.; Karas, Edwin L.; and Kalinoski, Richard W., 4,059,994, Cl. 73-23.100.

Karl Kroyer St. Anne's Limited: *See—*
Tapp, Frederick, 4,060,360, Cl. 425-83.000.

Karls, Albert J., to Moeller Manufacturing Company, Inc. Method of forming a handle by welding. 4,060,706, Cl. 219-107.000.

Karmann, Hans-Georg: *See—*
Baumann, Hans-Peter; and Karmann, Hans-Georg, 4,060,387, Cl. 8-169.000.

Karrer, Friedrich, to Ciba-Geigy Corporation. Phenoxy-phenoxy-alkylthionocarbamate compounds. 4,060,629, Cl. 424-300.000.

Kataoka, Hiroyuki: *See—*
Suzuki, Matsumi; Kataoka, Hiroyuki; and Ueno, Keiichi, 4,060,695, Cl. 179-1.0SB.

Kato, Chizuo. Ornamental assembly. 4,060,665, Cl. 428-542.000.

Kato, Hajime: *See—*
Harada, Yutaka; Itai, Noriyuki; Ucikawa, Hiroshi; Kato, Hajime; Sato, Katutoshi; and Itoh, Akira, 4,060,425, Cl. 106-90.000.

Katsumori, Shigeo: *See—*
Shimizu, Kazufusa; Katsumori, Shigeo; Nishikawa, Tadaaki; Senoo, Keisaku; Sakamaki, Kenji; Fujita, Makio; Tano, Teruo; Takano, Hiroshi; and Komori, Hideo, 4,060,390, Cl. 23-259.100.

Katz, Jerome. Method for hydrogen peroxide bleaching in acid or neutral solutions. 4,060,385, Cl. 8-111.000.

Katz, Jerome. Alkaline hydrogen peroxide bleaching method. 4,060,386, Cl. 8-111.000.

Kaufman, Sydney M., to Ford Motor Company. Copper coated iron-carbon eutectic alloy powders. 4,060,414, Cl. 75-246.000.

Kaufmann, Frank H., to Steel Heddle Manufacturing Company. Heddle frames. 4,060,102, Cl. 139-91.000.

Kavesh, Sheldon, to Allied Chemical Corporation. Production of filaments of hexagonal close-packed metals and alloys thereof. 4,060,430, Cl. 148-32.000.

Kawaai, Osamu: *See—*
Sakamoto, Kenji; and Kawaai, Osamu, 4,060,765, Cl. 325-21.000.

Kawagoshi, Hiroshi; Takeuchi, Masato; and Nakajima, Fumito, to Hitachi, Ltd. Process for steam reforming of hydrocarbons. 4,060,498, Cl. 252-373.000.

Kawakubo, Kazuo: *See—*
Hirayama, Kazuhiro; Sato, Yasushi; Tokiwa, Taisuke; Kawakubo, Kazuo; Iwatate, Fujio; and Nakatsui, Hisashi, 4,060,322, Cl. 355-60.000.
Hirayama, Kazuhiro; Sato, Yasushi; Tokiwa, Taisuke; Iwatate, Fujio; Kawakubo, Kazuo; and Nakatsui, Hisashi, 4,060,323, Cl. 355-60.000.

Kawase, Shoji: *See—*
Kuratsuji, Takatoshi; Kawase, Shoji; and Shima, Takeo, 4,060,516, Cl. 260-75.00T.

Kawashima, Hideo: *See—*
Kanemaru, Muneaki; Kimura, Tetsuo; Ishii, Norimichi; and Kawashima, Hideo, 4,060,564, Cl. 260-641.000.

Kazuo, Arai, to Nissan Denshi Company Limited. Automatic signal switching apparatus for a combined transceiver and radio or tape recorder set. 4,060,766, Cl. 325-22.000.

Kazuo, Yamaguchi; Genjiro, Kakogawa; Masayoshi, Hasuo; Goko, Nobuaki; and Maruyama, Yasuo, to Mitsubishi Chemical Industries. Preparation of titanium trichloride. 4,060,593, Cl. 423-492.000.

Kearney-National Inc.: *See—*
Hanke, Kenneth Earl; and Rees, Ned, 4,060,785, Cl. 337-201.000.

Keeling, Harmon H.: *See—*
Hudspeth, Thomas; and Keeling, Harmon H., 4,060,781, Cl. 333-98.00S.

Kehr, Edwin A. Hydroseparator stacker. 4,060,282, Cl. 302-16.000.

Keiper Trainingsysteme GmbH & Co.: *See—*
Pfleiderer, Werner; Arnold, Friedrich; and Haussermann, Richard, 4,060,239, Cl. 272-73.000.

Kel-Lite Industries, Inc.: *See—*
Nelson, Norman C., 4,060,723, Cl. 362-205.000.

Keller Manufacturing Co., Inc.: *See—*
Keller, William A., 4,060,135, Cl. 172-380.000.

Keller, William A., to Keller Manufacturing Co., Inc. Sheet metal garden tool. 4,060,135, Cl. 172-380.000.

Kelley, William John: *See*—
Sims, Larry Averett; and Kelley, William John, 4,059,917, Cl. 46-196.000.

Kelly, Buford L. Head gasket leak detector. 4,059,985, Cl. 73-46.000.

Kelp, Fritz: *See*—
Tratz, Herbert; Kelp, Fritz; and Netsch, Erich, 4,060,124, Cl. 165-110.000.

Kennecott Copper Corporation: *See*—
Ammann, Paul R.; Crimes, Peter B.; and Kim, Jonathan J., 4,060,409, Cl. 75-93.00R.
O'Day, William R., Jr.; Bensky, Norman D.; and LeBlanc, James D., 4,060,653, Cl. 427-423.000.

Kenneday, John W.; Kinney, Charles W.; Scott, Floyd L., Jr.; and Schmuck, Phillip W., to Baker International Corporation. Mechanically set liner hanger and running tool. 4,060,131, Cl. 166-315.000.

Kernforschungsanlage Julich GmbH: *See*—
Luhleich, Hartmut; Nickel, Hubertus; and Dias, Francesco, 4,060,592, Cl. 423-448.000.

Kerr, John L.; and Timochko, Michael J., to United States of America, Army. Loaded microstrip antenna. 4,060,810, Cl. 343-700.0MS.

Keune, Walter Hartmut: *See*—
Wagner, Fritz; Sahm, Hermann; and Keune, Walter Hartmut, 4,060,455, Cl. 195-29.000.

Kewpie Kabushiki Kaisha: *See*—
Sotoma, Koichi, 4,060,109, Cl. 141-83.000.
Takasuga, Kenji, 4,060,106, Cl. 141-1.000.

Khromov-Borisov, Nikolai Vasilievich; Torf, Samuil Fedorovich; Cherepanova, Valentina Pavlovna; Danilov, Anatoly Fedorovich; and Starshinova, Larisa Alexandrovna. Nondepolarizing muscle relaxant. 4,060,652, Cl. 424-329.000.

Kiel, Wolfgang: *See*—
Wedemeyer, Karlfried; Kiel, Wolfgang; and Evertz, Werner, 4,060,562, Cl. 260-623.00R.

Kikuchi, Mitsuru: *See*—
Iwahara, Makoto; Maruyama, Fumio; Fujiki, Goro; Mori, Toshinori; Hiyama, Norio; and Kikuchi, Mitsuru, 4,060,696, Cl. 179-1.0GQ.

Kikuchi, Yasuhei, to Usui International Industry, Ltd. Cooling fan control mechanism. 4,060,158, Cl. 192-82.00T.

Kikuchi, Yoshito. Bottle with electrically-operated pump. 4,060,182, Cl. 222-333.000.

Kikumoto, Ryoji; Tobe, Akihiro; Tonomura, Shinji; and Ikoma, Hidenobu, to Mitsubishi Chemical Industries Ltd. Pharmaceutically active 2-omega-aminoalkoxydiphenyl sulfides. 4,060,612, Cl. 424-248.520.

Kikumoto, Ryoji; Tobe, Akihiro; Tonomura, Shinji; and Ikoma, Hidenobu, to Mitsubishi Chemical Industries Ltd. Pharmaceutically active 2-(3-alkylaminopropoxy)diphenylmethanes. 4,060,641, Cl. 424-330.000.

Kilbourn, Edward E.; and Weir, W. David, to Rohm and Haas Company. Acetyl- and carbalkoxythioureidobenzophenones as anthelmintic agents. 4,060,636, Cl. 424-322.000.

Kim, Jonathan J.: *See*—
Ammann, Paul R.; Crimes, Peter B.; and Kim, Jonathan J., 4,060,409, Cl. 75-93.00R.

Kimura, Michio; Inaba, Shigeho; and Yamamoto, Hisao, to Sumitomo Chemical Company, Limited. Novel n'-acylated phenyl-hydrazine and -hydrazone derivatives. 4,060,550, Cl. 260-340.50R.

Kimura, Taro: *See*—
Tsubuko, Kazuo; Kimura, Taro; Hashimoto, Junichiro; and Kurotori, Tsuneo, 4,060,493, Cl. 252-62.10L.

Kimura, Tetsuo: *See*—
Kanemaru, Muneaki; Kimura, Tetsuo; Ishii, Norimichi; and Kawashima, Hideo, 4,060,564, Cl. 260-641.000.

Kindscher, Wolfgang; Fischer, Martin; Eicken, Karl; and Vitt, Guenter, to BASF Aktiengesellschaft. Sulfonamido containing carboxylic acids. 4,060,522, Cl. 260-293.850.

Kingman, Stephen A.; and Weaver, Leslie A., to LeBoeuf, Eugene A. Lift bed trailer suspension subframe. 4,060,145, Cl. 280-106.00T.

Kinney, Charles W.: *See*—
Kenneday, John W.; Kinney, Charles W.; Scott, Floyd L., Jr.; and Schmuck, Phillip W., 4,060,131, Cl. 166-315.000.

Kinoshita, Hideo: *See*—
Iwami, Isamu; and Kinoshita, Hideo, 4,060,657, Cl. 428-375.000.

Kirk, Donald. Concrete forms for building a concrete spillway. 4,060,217, Cl. 249-10.000.

Kirtley, James L., Jr.; and Baker, Richard H., to Massachusetts Institute of Technology. Electronic motor that includes an electronic waveform synthesizer and the synthesizer per se. 4,060,754, Cl. 318-218.000.

Kisbany, Frederick N. Method of foam-filling a tire carcass. 4,060,578, Cl. 264-46.600.

Kisteneich, Heinz: *See*—
Schmitzer, Willi; Kisteneich, Heinz; and Proksa, Ferdinand, 4,060,579, Cl. 264-51.000.

Kistler Instrumente AG: *See*—
Engeler, Paul; Baumgartner, Hans Ulrich; Dubendorfer, Ulrich; and Sonderegger, Hans Conrad, 4,059,999, Cl. 73-419.000.

Klein, Norman E., to Milliken Research Corporation. Method of making an apparatus for dyeing and printing of materials. 4,059,880, Cl. 29-157.00C.

Klein, Yitzhak: *See*—
Zioni, Jacob; Klein, Yitzhak; and Inbar, Dan, 4,060,730, Cl. 250-369.000.

Kleiner, Eduard K.; and Dear, Robert Ernest Arthur, to Ciba-Geigy Corporation. Unsaturated esters of polyfluoroalkylthioalcohols. 4,060,681, Cl. 560-222.000.

Klemann, Lawrence P.; and Newman, Gerald H., to Exxon Research and Engineering Company. Alkali metal anode-containing cells having electrolytes of organometallic-alkali metal salts and organic solvents. 4,060,674, Cl. 429-194.000.

Kletecka, George, to B. F. Goodrich Company, The. Preparation of N,N'-di-2-naphthyl-p-phenylenediamine. 4,060,552, Cl. 260-576.000.

Klingler, Karl H.; Aurich, Rudolf; and Habersang, Silke, to Deutsche Gold- und Silber-Scheideanstalt Vormals Roessler. Quaternary xanthinylalkyl nortropine. 4,060,618, Cl. 424-253.000.

Klopping, Hein Louis, to Du Pont de Nemours, E. I., and Company. Controlling fungal crop diseases with mixtures of methyl 2-benzimidazolecarbamate and certain specific fungicides. 4,060,624, Cl. 424-273.00R.

Klopping, Hein Louis, to Du Pont de Nemours, E. I., and Company. Mixtures of methyl 2-benzimidazolecarbamate and ethylenebisdithiocarbamic acid salts as foliar fungicides. 4,060,625, Cl. 424-273.00R.

Knox Manufacturing Co.: *See*—
Brown, Donald J., 4,060,310, Cl. 350-117.000.

Knox, Walter R.: *See*—
Paulik, Frank E.; Hershman, Arnold; Knox, Walter R.; and Roth, James F., 4,060,547, Cl. 260-532.000.

Kobayashi, Sigeyasu: *See*—
Iizuka, Masahiko; Suzuki, Jiro; and Kobayashi, Sigeyasu, 4,060,457, Cl. 195-127.000.

Kobe Steel, Ltd.: *See*—
Asari, Akira; and Tatsuno, Kenzou, 4,059,896, Cl. 29-403.000.

Kobelt, Jacob. Self-balancing brake shoes for caliper brake. 4,060,153, Cl. 188-72.600.

Kobres, Robert E., Jr. Geometric puzzle. 4,060,247, Cl. 273-157.00R.

Kodama, Jiro K.; Haynes, George R.; and Albert, James R., to Shell Oil Company. Therapeutic agents. 4,060,640, Cl. 424-326.000.

Kohler, Johann: *See*—
Grebe, Herbert; Hartwig, Wolfgang; Kohler, Johann; Rothe, Rudolf; and Schroder, Karl-Friedrich, 4,060,394, Cl. 23-284.000.

Kojima, Ichiro: *See*—
Iizuka, Masahiko; Suzuki, Jiro; and Kobayashi, Sigeyasu, 4,060,457, Cl. 195-127.000.

Komori, Hideo: *See*—
Shimizu, Kazufusa; Katsumori, Shigeo; Nishikawa, Tadaaki; Senoo, Keisaku; Sakamaki, Kenji; Fujita, Makio; Tano, Teruo; Takano, Hiroshi; and Komori, Hideo, 4,060,390, Cl. 23-259.100.

Kondo, Toshihiro, to Kondo, Toshihiro; and Fuji Photo Film Co., Ltd. Electromagnetically driven optical blade. 4,060,313, Cl. 350-269.000.

Konig, Hans-Joachim: *See*—
Johannes, Gerhard; Gemmer, Erwin; Konig, Hans-Joachim; and Reinhard, Gunter, 4,060,655, Cl. 428-35.000.

Konort, Mark D.: *See*—
Lamberti, Vincent; and Konort, Mark D., 4,060,495, Cl. 252-106.000.

Koransha Co., Ltd.: *See*—
Kurita, Sumihiko, 4,060,095, Cl. 136-234.000.

Kotcharian, Michel, to Technigaz. Conduit for conveying a fluid, the temperature of which is different from the surrounding temperature. 4,060,263, Cl. 285-47.000.

Kotzsch, Hans-Joachim; and Vahlensieck, Hans-Joachim, to Dynamit Nobel Aktiengesellschaft. Method of preparing N,N'-bis-trimethylsilylurea. 4,060,536, Cl. 260-448.20E.

Kotzsch, Hans Joachim; Vahlensieck, Hans-Joachim; and Seiler, Claus-Dieter, to Dynamit Nobel Aktiengesellschaft. Process for the preparation of silane esters of tertiary alcohols. 4,060,538, Cl. 260-448.80R.

Kraftwerk Union Aktiengesellschaft: *See*—
Acher, Heinz, 4,060,452, Cl. 176-36.00R.
Schabert, Hans-Peter; and Laurer, Erwin, 4,060,453, Cl. 176-38.000.
Tratz, Herbert; Kelp, Fritz; and Netsch, Erich, 4,060,124, Cl. 165-110.000.
Weghaupt, Erich, 4,060,743, Cl. 310-52.000.

Kramer, Wolfgang: *See*—
Meiser, Werner; Kramer, Wolfgang; Buchel, Karl Heinz; and Plempel, Manfred, 4,060,623, Cl. 424-269.000.

Krasnorutsky, Viktor Petrovich: *See*—
Kaporovich, Vladimir Georgievich; Udovenko, Vitaly Kirillovich; Krasnorutsky, Viktor Petrovich; and Chechenets, Akhmet Galievich, 4,059,977, Cl. 72-69.000.

Krishna, Surinder: *See*—
Houston, Douglas E.; and Krishna, Surinder, 4,060,821, Cl. 357-22.000.

Krishnaiyer, Ramesh: *See*—
Pascucci, Gregory A.; Krishnaiyer, Ramesh; and Pridemore, Donald Floyd, 4,060,735, Cl. 307-3.000.

Kron, Gerald Joseph, to Singer Company, The. Neural receptor augmented G seat system. 4,059,909, Cl. 35-12.00E.

Kronos Titan G.m.b.H.: *See*—
Hartmann, Achim; Kulling, Achim; and Thumm, Hans, 4,060,584, Cl. 423-149.000.

Krutzner, Karl, Jr.: *See*—
Weber, Paul; Mollenkopf, Hans; Henning, Kurt; Heinemann, Otto; Schmits, Heinz-Herbert; Rother, Wolfgang; Ritzmann, Horst; Wurr, Jurgen; Krutzner, Karl, Jr.; Schossler, Werner; Goldmann, Wolf; and Schepers, Georg, 4,060,375, Cl. 432-14.000.

Kubik, Philip A. Hydraulic motor having positive locking means. 4,060,022, Cl. 91-40.000.

Kubota, Yuzuru: *See*—
Okuyama, Toshiaki; and Kubota, Yuzuru, 4,060,753, Cl. 318-175.000.
Kudlacek, Donald S. Compound archery bow with eccentric cam elements. 4,060,066, Cl. 124-23.00R.
Kuhn, John E., to Aluminum Company of America. Melting process. 4,060,408, Cl. 75-68.00R.
Kuhn, S.A.: *See*—
Reber, Walter, 4,059,944, Cl. 56-370.000.
Kuhr, Manfred: *See*—
Hrstka, Vladimir; Hubner, Manfred; Kuhr, Manfred; Schmidt, Felix Helmut; and Aumuller, Walter, 4,060,626, Cl. 424-274.000.
Kulling, Achim: *See*—
Hartmann, Achim; Kulling, Achim; and Thumm, Hans, 4,060,584, Cl. 423-149.000.
Kunkle, James Raymond; and Olsson, Billy Erik, to AMP Incorporated. Low profile DIP receptacle. 4,060,296, Cl. 339-17.0CF.
Kuntschik, Lawrence F.: *See*—
Macaluso, Anthony, Sr.; and Kuntschik, Lawrence F., 4,060,557, Cl. 260-604.0HF.
Kuramochi, Shigeaki. Toy sewing machine. 4,060,044, Cl. 112-158.00R.
Kuratsuji, Takatoshi; Kawase, Shoji; and Shima, Takeo, to Teijin Limited. Naphthalate polyester filaments. 4,060,516, Cl. 260-75.00T.
Kureha Kagaku Kogyo Kabushiki Kaisha: *See*—
Ohya, Masaki; and Hoshino, Mitsuru, 4,060,650, Cl. 427-161.000.
Kurita, Sumihiko, to Koransha Co., Ltd. Thermocouple protecting tube. 4,060,095, Cl. 136-234.000.
Kurmeier, Hans-Adolf: *See*—
Gante, Joachim; Kurmeier, Hans-Adolf; Orth, Dieter; Schacht, Erich; and Wild, Albrecht, 4,060,633, Cl. 424-304.000.
Kuroda, Takayuki: *See*—
Takami, Akihiro; Kuroda, Takayuki; Nagano, Katsuo; and Matsuoka, Michio, 4,060,661, Cl. 428-432.000.
Kuroda, Yoshiyuki, to Citizen Watch Co., Ltd.; and Sunarrow Koski, Co., Ltd. Band for wrist-watch. 4,060,185, Cl. 224-4.00F.
Kuroki, Masataka: *See*—
Uchikuga, Saburo; and Kuroki, Masataka, 4,060,551, Cl. 260-561.00S.
Kurotori, Tsuneo: *See*—
Tsubuko, Kazuo; Kimura, Taro; Hashimoto, Junichiro; and Kurotori, Tsuneo, 4,060,493, Cl. 252-62.10L.
Kurtz, Bruce Edward: *See*—
Smalley, Edmund W.; Kurtz, Bruce Edward; and Bandyopadhyay, Bhaskar, 4,060,460, Cl. 203-29.000.
Kurtz, George W. Tie locating device. 4,059,906, Cl. 33-180.00R.
Kuwahara, Akiyasu: *See*—
Mori, Michitsugu; Ohfuji, Mitsuo; and Kuwahara, Akiyasu, 4,060,573, Cl. 261-23.00B.
Kuwahara, Heikichi: *See*—
Fujie, Kunio; Nakayama, Wataru; Kuwahara, Heikichi; and Kakizaki, Kimio, 4,060,125, Cl. 165-133.000.
Kuzev, Lyubomir Vladimirov: *See*—
Stoev, Stoycho Mitrev; Metodiev, Metodi Stoyanov; Kuzev, Lyubomir Vladimirov; Vedrichkov, Petko Georgiev; Sapunarov, Ivan Mitrev; Vassilev, Vassil Vladimirov; Dimitrov, Spas Petkov; Gasharov, Vihar Assenov; Russev, Sheko Kolev; and Mitrev, Kostadin Georgiev, 4,060,481, Cl. 209-170.000.
Kwait, Benjamin F. Fuel saving system. 4,060,374, Cl. 431-190.000.
L. M. Ericsson Pty. Ltd.: *See*—
Maxwell, Anthony Robert; and Platts, John Charles, 4,060,797, Cl. 340-347.0DD.
L. P. Machinery Ltd.: *See*—
Piereder, Ludwig, 4,060,349, Cl. 417-482.000.
Lach, John H.: *See*—
Shatila, Mounir A.; Veeneman, John L.; Lach, John H.; and Harmon, James F., 4,060,367, Cl. 425-311.000.
Lafont, Andre: *See*—
Guienne, Paul; Herrouin, Guy; Lafont, Andre; Bertin, Jean, deceased; Bertin, Michel; Bertin, Laurent; Bertin, Philippe; Midy nee Bertin, Catherine; Gonzalez-Camino nee Bertin, Francoise; and Bertin nee Loustau, Genevieve, heirs, 4,060,147, Cl. 180-121.000.
Lagarrigue, Serge. Security system. 4,060,039, Cl. 109-3.000.
LaHaye, Paul G.; Bjerklie, John W.; and Gallant, Gerald G., Jr., to Hague International. Energy conserving process furnace system and components thereof. 4,060,379, Cl. 432-179.000.
Lakerveld, Herman Gerard; van Rosmalen, Gerard Eduard; Bulthius, Kornelis; and Sinjou, Johannes Petrus, to U.S. Philips Corporation. Playing apparatus, in particular a video player for playing a record which is made of a transparent material and provided with a central hole. 4,060,248, Cl. 274-41.60R.
Laliberte, Real: *See*—
Ferland, Jean-Marie; Laliberte, Real; Lippmann, Wilbur; and Pugsley, Thomas A., 4,060,613, Cl. 424-250.000.
Lambel, Reinhold; and Maynard, Steven. Drain cleaner providing sudden blast of gas. 4,059,858, Cl. 4-255.000.
Lamberti, Vincent; and Konort, Mark D., to Lever Brothers Company. Hydroxyaryldialkyl sulfonium halides. 4,060,495, Cl. 252-106.000.
Lance, Richard T.: *See*—
Papafingos, Pandelis N.; and Lance, Richard T., 4,060,118, Cl. 159-49.000.
Landgraf, Glenn A.; and Ebel, Fred H., to Gold Thread Machinery Co. Folder. 4,060,227, Cl. 270-66.000.
Lang, Robert J., to Exxon Research and Engineering Company. Coal liquefaction bottoms conversion by coking and gasification. 4,060,478, Cl. 208-8.000.
Langan, John J. Combination chalk holder and cue slide. 4,060,243, Cl. 273-18.000.
Lanham, Albert Frank; Barned, Philip Sydney; and Potter, Sydney Ralph, to Bryant and May. Match-head compositions. 4,060,434, Cl. 149-2.000.
Lantzsch, Reinhard: *See*—
Schmidt, Arthur H.; Lantzsch, Reinhard; Marhold, Albrecht; Lehment, Klaus-Friedrich; and Staffe, Adolf, 4,060,549, Cl. 260-543.00F.
Lappington, John P.; and Shafer, Leroy, to Chrysler Corporation. Input sensor circuit for a digital engine controller. 4,060,714, Cl. 364-431.000.
Laser Graphic Systems Corporation: *See*—
Evans, Charles P., 4,060,032, Cl. 101-401.100.
Laszlo, Marcel. Process for removing heavy metals from fluid media. 4,060,410, Cl. 75-109.000.
Lauck, Helmut, to Varta Batterie Aktiengesellschaft. Galvanic element with a negative electrode of light metal, a non-aqueous electrolyte and a positive electrode. 4,060,675, Cl. 429-194.000.
Laure, George R., to Laure Prosthetics, Inc. Ribbed finger joint implant. 4,059,854, Cl. 3-1.910.
Laure Prosthetics, Inc.: *See*—
Laure, George R., 4,059,854, Cl. 3-1.910.
Laurer, Erwin: *See*—
Schabert, Hans-Peter; and Laurer, Erwin, 4,060,453, Cl. 176-38.000.
Leach, Bruce Eugene, to Continental Oil Company. Disproportionation of xylenols with phenol to form cresols. 4,060,560, Cl. 260-621.00D.
LeBlanc, James D.: *See*—
O'Day, William R., Jr.; Bensky, Norman D.; and LeBlanc, James D., 4,060,653, Cl. 427-423.000.
LeBoeuf, Eugene A.: *See*—
Kingman, Stephen A.; and Weaver, Leslie A., 4,060,145, Cl. 280-106.00T.
Leco Corporation: *See*—
Sitek, George J., 4,060,717, Cl. 364-497.000.
Lee, Denis; and Cantwell, Alan David Cole, to Imperial Chemical Industries Limited. Operation of mercury-cathode cells. 4,060,463, Cl. 204-99.000.
Lee, Frank James: *See*—
Cox, William Edward; and Lee, Frank James, 4,060,138, Cl. 173-49.000.
Lee, Lin-Fa, to Du Pont de Nemours, E. I., and Company. Sheath-core cospun heather yarns. 4,059,949, Cl. 57-140.0BY.
Leeper, William E., Jr. Multiple purpose woodworking apparatus. 4,060,112, Cl. 144-134.00R.
Leh, David T., to Sperry Rand Corporation. Method of making a pin actuator connector. 4,059,888, Cl. 29-629.000.
Lehmann, Rolf: *See*—
Christ, Alfred; and Lehmann, Rolf, 4,059,976, Cl. 72-19.000.
Lehment, Klaus-Friedrich: *See*—
Schmidt, Arthur H.; Lantzsch, Reinhard; Marhold, Albrecht; Lehment, Klaus-Friedrich; and Staffe, Adolf, 4,060,549, Cl. 260-543.00F.
Leib, Roger K. Modular furniture. 4,060,277, Cl. 297-248.000.
Leigh Products, Inc.: *See*—
Wilkinson, Eric, 4,060,266, Cl. 292-148.000.
Lemmens, Jean Pierre Gustaaf Rosa: *See*—
Carteus, Marc Felix Maurice; De Bruyne, Yvrs Marie Grovgrs; Lemmens, Jean Pierre Gustaaf Rosa; and Stubbe, Elie Jozef, 4,060,057, Cl. 122-451.00R.
Le Noane, Georges E.; and Mathern, Andre M. Adjustable connector assembly for laser effect diode, focussing lens and an optical fibre in optical fibre transmission system. 4,060,309, Cl. 350-96.00C.
Leo Pharmaceutical Products Ltd. A/S: *See*—
Daehne, Welf von; and Rasmussen, Poul Rodbroe, 4,060,606, Cl. 424-238.000.
Les Industries BFG Limitee: *See*—
Drouin, Claude, 4,060,069, Cl. 126-200.000.
Lever Brothers Company: *See*—
Bringi, Naganathan Viswanath; and Padley, Frederick Bolton, 4,060,646, Cl. 426-607.000.
Lamberti, Vincent; and Konort, Mark D., 4,060,495, Cl. 252-106.000.
Lever, Paul H.; and Mohr, Clifford D., to Fireplace Corporation of America. Air cooled freestanding fireplace. 4,060,068, Cl. 126-120.000.
Levesque, George N., to Brown & Sharpe Manufacturing Company. Clutch teeth. 4,060,007, Cl. 74-457.000.
Leviton Manufacturing Co., Inc.: *See*—
Poliak, John M.; Lopez, Juan M.; and Gritz, Robert W., 4,060,305, Cl. 339-269.000.
Poliak, John N., 4,060,020, Cl. 85-1.00L.
Lewis, Clifford J., to National Lime Association. Gaseous and liquid reactant treatment. 4,060,587, Cl. 423-210.000.
Licentia Patent-Verwaltungs-G.m.b.H.: *See*—
Russer, Peter; and Gruber, Johann, 4,060,739, Cl. 307-319.000.
Lieber, Raymond Stanley. Safety guard for power operated machine. 4,060,160, Cl. 192-134.000.
Lin, Heh-Sen; and Adams, John M., to Medtronic, Inc. Variable P-R interval pacemaker. 4,060,090, Cl. 128-419.0PG.
Lin, Kingso C.; and Hammond, Donald J., to Owens-Corning Fiberglas Corporation. Glass fibers coated with a polybutadiene homopolymer latex-containing impregnant. 4,060,658, Cl. 428-378.000.
Lindberg, Richard M.; and Raghavachari, Srinivas T., to MPL, Inc. Dual-ingredient medication dispenser. 4,060,082, Cl. 128-218.00M.

Lindhuber, Hermann: *See*—
Uhlirsch, Kurt; and Lindhuber, Hermann, 4,060,575, Cl. 261-111.000.
Lindsay, Robert A. Cooling seat. 4,060,276, Cl. 297-180.000.
Ling, Hans Gway: *See*—
Merkel, Paul Barrett; and Ling, Hans Gway, 4,060,420, Cl. 96-114.100.
Linke, Walter R.; and Fleischman, Andor A., to Bell & Howell Company. Copier lens of reflex design. 4,060,312, Cl. 350-189.000.
Linn, Wallace Leon. Timer switch assembly having escapement mechanism. 4,060,702, Cl. 200-35.00R.
Linotype-Paul Limited: *See*—
Norris, John Henry, 4,060,210, Cl. 242-71.100.
Linscott, Phillip S., Jr., to Sundstrand Corporation. Structure for attaching a permanent magnet to a rotating shaft. 4,060,745, Cl. 310-156.000.
Lippmann, Wilbur: *See*—
Ferland, Jean-Marie; Laliberte, Real; Lippmann, Wilbur; and Pugsley, Thomas A., 4,060,613, Cl. 424-250.000.
Litton Systems, Inc.: *See*—
Huddle, James R., 4,060,718, Cl. 364-421.000.
Litz, Donald C., to Westinghouse Electric Corporation. Superconductive dynamoelectric machine with improved cryogenic support arrangement. 4,060,742, Cl. 310-52.000.
Liu, Robert Chung-Huan; and Hughes, John Lawrence, to Armour Pharmaceutical Company. Substituted 4-hydroxyphenyl guanidines. 4,060,554, Cl. 260-565.000.
Loeb, Leopold, to General Electric Company. Automatic icemaker including means for minimizing the supercooling effect. 4,059,970, Cl. 62-353.000.
Loffredo, Stefano: *See*—
Groves, James D.; and Loffredo, Stefano, 4,060,583, Cl. 264-272.000.
Lofgren, Stig-Gunnar, to Mo och Domsjo AB. Digging and planting machine. 4,060,043, Cl. 111-3.000.
Lohr, Alfred; and Tschek, Wolfgang, to F. Kuppersbusch & Sohne Aktiengesellschaft. Apparatus for adding salt or seasonings to food being cooked in steam cookers. 4,060,026, Cl. 99-346.000.
Lohr, Delmar Frederick, Jr.; and Wakefield, Lynn Burritt, to Firestone Tire & Rubber Company, The. Process for preparing 2-allyl phenol. 4,060,563, Cl. 260-624.00B.
Lohrmann, Dieter, to United States of America, Army. Self test circuit for multichannel radio receivers. 4,060,767, Cl. 325-363.000.
Long, Margaret E., to R. J. Reynolds Tobacco Company. Glucose isomerization process. 4,060,456, Cl. 195-31.00F.
Longhi, Giuliano: *See*—
Baraldi, Enzo; and Longhi, Giuliano, 4,060,042, Cl. 110-14.000.
Longo, John M.: *See*—
Clavenna, LeRoy R.; Longo, John M.; and Horowitz, Harold S., 4,060,500, Cl. 252-471.000.
Lonza, Ltd.: *See*—
Fritzsche, Christoph, 4,059,983, Cl. 73-15.600.
Lopez, Juan M.: *See*—
Poliak, John M.; Lopez, Juan M.; and Gritz, Robert W., 4,060,305, Cl. 339-269.000.
Lucas Industries Limited: *See*—
Wright, Owen Edgar, 4,060,758, Cl. 323-17.000.
Lucking, Hans Joachim: *See*—
Maass, Gunther; Lucking, Hans Joachim; Buchner, Werner; and Degen, Bruno, 4,060,537, Cl. 260-448.20E.
Ludwig, Duane H. Quick catch and release clamp for releaseably holding a spare tire of a vehicle. 4,060,171, Cl. 214-451.000.
Luessem, Heribert: *See*—
Rapp, Wolfgang; Haas, Karl-Heinz; and Luessem, Heribert, 4,060,388, Cl. 23-230.00R.
Luhleich, Hartmut; Nickel, Hubertus; and Dias, Francesco, to Kernforschungsanlage Julich GmbH. Method of making shaped carbonaceous bodies. 4,060,592, Cl. 423-448.000.
Luhowy, Roberta R.: *See*—
Cieciuch, Ronald F. W.; Luhowy, Roberta R.; Meneghini, Frank A.; and Rogers, Howard G., 4,060,417, Cl. 96-3.000.
Luitwieler, Samuel H.; and Horrocks, Donald L., to Beckman Instruments, Inc. Gamma counter calibration system. 4,060,726, Cl. 250-252.000.
Lukens, Edward E., to Insuldeck Corporation. Panel construction for roofs and the like. 4,059,936, Cl. 52-492.000.
Luscombe, Gene A. Stack forming vehicle. 4,060,028, Cl. 100-100.000.
Lutz, George H. Heating system and element therefor. 4,060,194, Cl. 237-1.0SL.
Maass, Gunther; Lucking, Hans Joachim; Buchner, Werner; and Degen, Bruno, to Bayer Aktiengesellschaft. Preparation of organosiloxanes. 4,060,537, Cl. 260-448.20E.
Maass, Hans: *See*—
Eckold, Gerd-Jurgen; and Maass, Hans, 4,060,046, Cl. 113-54.00R.
Macaluso, Anthony, Sr.; and Kuntschik, Lawrence F., to Texaco Inc. Hydroformylation. 4,060,557, Cl. 260-604.0HF.
Macauley, William T., to Ford Motor Company. Contoured sheet metal airfoil fans. 4,060,338, Cl. 416-214.00R.
MacKenzie, Robert D.: *See*—
Dolfini, Joseph E.; and MacKenzie, Robert D., 4,060,630, Cl. 424-300.000.
Mackie, Gordon E.; and Morris, Peter A., to Allis-Chalmers Corporation. Means for flaring openings in cylindrical bodies. 4,059,979, Cl. 72-342.000.
Maeda, Hidetoshi; and Sasaki, Takehiko, to Sharp Kabushiki Kaisha. Touch type contactless switch structure for electronic wristwatches having insulative member precluding establishment of shunt path by foreign matter. 4,059,956, Cl. 58-23.00R.
Maeda, Sachio; Saito, Nagoa; Arai, Shinji; and Haishi, Yuichiro, to Mitsubishi Denki Kabushiki Kaisha. Electrolytic machining system. 4,060,467, Cl. 204-129.750.
Maekawa, Yukio; Satomura, Masato; and Umehara, Akira, to Fuji Photo Film Co., Ltd. Furanacroyl esters. 4,060,685, Cl. 542-413.000.
Maeyerspeer, Bernhard, to Porsche Design, Firma. Energy absorbing member. 4,060,278, Cl. 297-386.000.
Magenheim, Bertram, to System Development Corporation. Deicing apparatus and method. 4,060,212, Cl. 244-134.00D.
Magnusson, Sten Evert, to Telefonaktiebolaget L M Ericsson. Two-party telephone system. 4,060,700, Cl. 179-28.000.
Maierson, Theodore, to Standard Register Company, The. Record material. 4,060,262, Cl. 282-27.500.
Maietta, Josephine. Animal harness. 4,060,056, Cl. 119-96.000.
Makita, Jun-ichi: *See*—
Tachihara, Noribumi; Mizohata, Yukio; and Makita, Jun-ichi, 4,059,916, Cl. 40-130.00K.
Mako, John; and Pimbley, Walter Thornton, to International Business Machines Corporation. Nozzle for an ink jet printer. 4,060,812, Cl. 346-75.000.
Mazzi, Philip J.; Epstein, Harold M.; Applebaum, David C.; Gallagher, William J.; and Campbell, Bernerd E., to Battelle Memorial Institute. Directing radiation. 4,060,769, Cl. 330-4.300.
Maloney, James E.: *See*—
Chunat, Gerald W.; and Maloney, James E., 4,060,433, Cl. 148-6.170.
Mamiya Koki Kabushiki Kaisha: *See*—
Goto, Mituhiro; Hashimoto, Isao; Watanabe, Shugo; and Itabashi, Koji, 4,060,411, Cl. 75-138.000.
Mandelik, Bernard G., to Pullman Incorporated. Process for removing sulfur-containing gases from waste gases. 4,060,588, Cl. 423-242.000.
Mangold, Gregory L.: *See*—
Mefferd, Roy J.; and Mangold, Gregory L., 4,060,259, Cl. 280-656.000.
Manrique, Jorge: *See*—
Edwards, Ronald Alexander Nixon; and Manrique, Jorge, 4,060,203, Cl. 241-7.000.
Marchetti, Augusto. Machine for sealing parallelepipedal boxes having a variable height. 4,060,442, Cl. 156-358.000.
Marchitello, Raymond. Drill grinding attachment. 4,059,928, Cl. 51-241.00R.
Marcoll, Joachim: *See*—
Alpen, Ulrich Von; Fenner, Jurgen; Marcoll, Joachim; and Rabenau, Albrecht, 4,060,672, Cl. 429-191.000.
Marconi Company Limited, The: *See*—
Davies, Eric, deceased; and Marr, Douglas Philip, co-executor, 4,060,806, Cl. 343-17.700.
Marhold, Albrecht: *See*—
Schmidt, Arthur H.; Lantzsch, Reinhard; Marhold, Albrecht; Lehment, Klaus-Friedrich; and Staffe, Adolf, 4,060,549, Cl. 260-543.00F.
Maries, Alan; and Rogers, Philip Sydney, to National Research Development Corporation. Method for making aligned fibrous crystals. 4,060,401, Cl. 65-33.000.
Marikar, Yusuf Mohamed Faruq: *See*—
Askew, Barry Anthony; Holland, Ronald; Inman, Douglas; and Marikar, Yusuf Mohamed Faruq, 4,060,667, Cl. 429-103.000.
Marquis, Edgar E., to Robertshaw Controls Company. Method of joining thin and thick switch members. 4,059,897, Cl. 29-432.100.
Marr, Douglas Philip, co-executor: *See*—
Davies, Eric, deceased; and Marr, Douglas Philip, co-executor, 4,060,806, Cl. 343-17.700.
Marshall, Bruce H.; and Blenner, Henry E. Plug cap. 4,060,297, Cl. 339-37.000.
Marshall, Lowell K.: *See*—
Bettencourt, Thomas S.; and Marshall, Lowell K., 4,060,133, Cl. 171-1.000.
Marshall, Robert, to Davy-Loewy Limited. Bounce-free object arresting system. 4,060,029, Cl. 101-4.000.
Martin Marietta Corporation: *See*—
Byer, Norman E.; Stokowski, Stanley E.; and Venables, John D., 4,060,729, Cl. 250-338.000.
Martinez, Robert. Rake cleaning attachment. 4,059,945, Cl. 56-400.100.
Maruyama, Fumio: *See*—
Iwahara, Makoto; Maruyama, Fumio; Fujiki, Goro; Mori, Toshinori; Hiyama, Norio; and Kikuchi, Mitsuru, 4,060,696, Cl. 179-1.0GQ.
Maruyama, Yasuo: *See*—
Kazuo, Yamaguchi; Genjiro, Kakogawa; Masayoshi, Hasuo; Goko, Nobuaki; and Maruyama, Yasuo, 4,060,593, Cl. 423-492.000.
Maryland Cup Corporation: *See*—
Collins, Richard D., 4,060,577, Cl. 264-45.400.
Masayoshi, Hasuo: *See*—
Kazuo, Yamaguchi; Genjiro, Kakogawa; Masayoshi, Hasuo; Goko, Nobuaki; and Maruyama, Yasuo, 4,060,593, Cl. 423-492.000.
Mascarello, Jean Marius; Godin, Paul; and Millet, Jacques Francois, to Electricite De France. Process for preparing hydrogen from water. 4,060,466, Cl. 204-129.000.
Maschinenfabrik Hennecke GmbH: *See*—
Schmitzer, Willi; Kisteneich, Heinz; and Proksa, Ferdinand, 4,060,579, Cl. 264-51.000.
Massachusetts Institute of Technology: *See*—
Bowman, Harry Frederick, 4.059,982, Cl. 73-15.00A.

Kirtley, James L., Jr.; and Baker, Richard H., 4,060,754, Cl. 318-218.000.
Yannas, Ioannis V.; Burke, John F.; Gordon, Philip L.; and Huang, Chor, 4,060,081, Cl. 128-156.000.
Masure, Daniel; Guillaumont, Jacques; and Pigeaud, Jean-Marie, to Rhone-Poulenc Industries. Electrolytic cell of the diaphragm type comprising a base made of an insulating material. 4,060,474, Cl. 204-270.000.
Mathern, Andre M.: *See—*
Le Noane, Georges E.; and Mathern, Andre M., 4,060,309, Cl. 350-96.00C.
Mathisen, Einar S.: *See—*
Jacobowitz, Lawrence; Mathisen, Einar S.; and Thorp, Lawrence D., 4,060,327, Cl. 356-96.000.
Matier, William Lesley; and Catt, John David, to Mead Johnson & Company. 2-Piperazinyl-6,7-dimethoxyquinazolines. 4,060,615, Cl. 424-251.000.
Matsubara, Hironaga; and Yamanouchi, Shousuke, to Sumitomo Electric Industries, Ltd. Electric wires or cables with styrene containing dielectric layer. 4,060,659, Cl. 428-379.000.
Matsuki, Koji, to Tokyo Shibaura Electric Co., Ltd. Driving circuit for a liquid crystal display device. 4,060,802, Cl. 340-324.00M.
Matsumoto Dental College: *See—*
Takahashi, Shigeo; Ito, Michio; Nagasawa, Sakae; and Suzuki, Sigeo, 4,060,120, Cl. 164-35.000.
Matsumoto, Takeshi; Chiba, Kazukiyo; Shioyama, Atsuo; and Yamaguchi, Yoshitake, to Kabushiki Kaisha Komatsu Seisakusho. Muffler mounting apparatus in construction machinery. 4,060,143, Cl. 180-64.00A.
Matsuoka, Michio: *See—*
Takami, Akihiro; Kuroda, Takayuki; Nagano, Katsuo; and Matsuoka, Michio, 4,060,661, Cl. 428-432.000.
Matsushima, Ryuzo. Tightening device for threaded screw part. 4,060,113, Cl. 145-50.00D.
Matsushima, Ryuzo. Tightening device for threaded screw part. 4,060,114, Cl. 145-50.00D.
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Naphtachimie: *See*—
Paolini, Laurent, 4,060,190, Cl. 228-2.000.
Natale, Paul R.: *See*—
Jayne, Max L.; and Natale, Paul R., 4,060,300, Cl. 339-74.00R.
National Lime Association: *See*—
Lewis, Clifford J., 4,060,587, Cl. 423-210.000.
National Machinery Company, The: *See*—
Fick, Paul A., 4,059,860, Cl. 10-11.00R.
National Patent Development Corporation: *See*—
Vit, Jaroslav, 4,060,600, Cl. 424-53.000.
National Research Development Corporation: *See*—
Askew, Barry Anthony; Holland, Ronald; Inman, Douglas; and Marikar, Yusuf Mohamed Faruq, 4,060,667, Cl. 429-103.000.
Maries, Alan; and Rogers, Philip Sydney, 4,060,401, Cl. 65-33.000.
National Starch and Chemical Corporation: *See*—
Tessler, Martin M., 4,060,683, Cl. 536-50.000.
National Steel Corporation: *See*—
Nabhan, George A., 4,060,186, Cl. 226-1.000.
Nayagam, Kandiah Tharma. Pneumatically controlled rigid coreformer. 4,060,218, Cl. 249-65.000.
Naylor, Carter G.; and Yeakey, Ernest L., to Texaco Development Corporation. Novolak derivatives as defoamers. 4,060,501, Cl. 252-548.000.
NCR Corporation: *See*—
Nelson, Carl R.; Pierce, David R.; Depew, Noel F.; and Harp, Marlyn F., 4,060,161, Cl. 197-1.00R.
Neal, Willie, to Carter, Samuel R., a part interest. Microphone mounting and control system. 4,060,697, Cl. 179-1.0VE.
Negishi, Takao; and Tomiita, Kazuo, to Toray Industries, Inc. Multifilament yarn having novel configuration and a method for producing the same. 4,059,950, Cl. 57-140.00J.
Nelson, Carl R.; Pierce, David R.; Depew, Noel F.; and Harp, Marlyn F., to NCR Corporation. Vibration dampening means for printing mechanism. 4,060,161, Cl. 197-1.00R.
Nelson, Gerald B., to Papakube Corporation. Apparatus for making stable blocks formed of shredded paper-like material. 4,060,363, Cl. 425-147.000.
Nelson, Norman C., to Kel-Lite Industries, Inc. Flashlight assembly. 4,060,723, Cl. 362-205.000.
Nelson, Thomas Larson, to Du Pont de Nemours, E. I., and Company. Fluid process for making continuous filament heather yarn. 4,059,873, Cl. 28-271.000.
Nelson, Warren A., to Philip A. Hunt Chemical Corporation. Process for etching of metal. 4,060,447, Cl. 156-642.000.
Nemiroff, Michael; Yue, Hong Jun; and Schevey, William Russell, to Allied Chemical Corporation. Yttrium iron garnet disks on gadolinium gallium substrates for microwave applications. 4,060,448, Cl. 156-653.000.
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Mounts, Frank William; and Netravali, Arun Narayan, 4,060,834, Cl. 358-261.000.
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Tratz, Herbert; Kelp, Fritz; and Netsch, Erich, 4,060,124, Cl. 165-110.000.
Neumo Armaturenfabrik-Apparatebau-Metallgiesserei GmbH, Firma: *See*—
Fischer, Josef, 4,060,220, Cl. 251-306.000.
Neville, George Edgar, to George Neville Truck Equipment Limited. Vehicle body covering device. 4,060,273, Cl. 296-100.000.
Newman, Gerald H.: *See*—
Klemann, Lawrence P.; and Newman, Gerald H., 4,060,674, Cl. 429-194.000.
Newton, Alwin B., to Borg-Warner Corporation. Capacity control for rotary compressor. 4,060,343, Cl. 417-309.000.
Neyret, Guy, to Societe Anonyme dite: Etablissement Genoud & Cie. Valve for gas lighter. 4,060,202, Cl. 239-579.000.
Nibby, Chester M., Jr.: *See*—
Feldman, Paul S.; Johnson, Robert B.; and Nibby, Chester M., Jr., 4,060,794, Cl. 364-900.000.
Nichireki Chemical Industry Company Limited: *See*—
Harada, Yutaka; Itai, Noriyuki; Ucikawa, Hiroshi; Kato, Hajime; Sato, Katutoshi; and Itoh, Akira, 4,060,425, Cl. 106-90.000.
Nicholas, William: *See*—
Heklowski, Florian; and Nicholas, William, 4,059,958, Cl. 60-614.000.
Nickel, Hubertus: *See*—
Luhleich, Hartmut; Nickel, Hubertus; and Dias, Francesco, 4,060,592, Cl. 423-448.000.
Nihon Kinzoku Kogyo Kabushiki Kaisha: *See*—
Nishimura, Yoshiki; Sakiyama, Kazutaka; Adachi, Tadao; and Harada, Kenji, 4,060,389, Cl. 23-252.00A.
Niigata Engineering Co., Ltd.: *See*—
Shimizu, Kazufusa; Katsumori, Shigeo; Nishikawa, Tadaaki; Senoo, Keisaku; Sakamaki, Kenji; Fujita, Makio; Tano, Teruo; Takano, Hiroshi; and Komori, Hideo, 4,060,390, Cl. 23-259.100.
Nippon Electric Company, Limited: *See*—
Inagawa, Takashi; and Mitsuhashi, Sadayuki, 4,060,782, Cl. 335-112.000.
Nippon Kogaku K.K.: *See*—
Furuta, Koichi, 4,060,818, Cl. 354-266.000.
Nishida, Kouji, to Matsushita Electric Industrial Co., Ltd. Signal attenuator. 4,060,780, Cl. 333-81.00A.
Nishikawa, Tadaaki: *See*—
Shimizu, Kazufusa; Katsumori, Shigeo; Nishikawa, Tadaaki; Senoo, Keisaku; Sakamaki, Kenji; Fujita, Makio; Tano, Teruo; Takano, Hiroshi; and Komori, Hideo, 4,060,390, Cl. 23-259.100.
Nishimura, Kotaro, to Hitachi, Ltd. Sensing amplifier for capacitive MISFET memory. 4,060,740, Cl. 307-362.000.
Nishimura, Yoshiki; Sakiyama, Kazutaka; Adachi, Tadao; and Harada, Kenji, to Toyo Soda Manufacturing Co., Ltd.; and Nihon Kinzoku Kogyo Kabushiki Kaisha. Apparatus for use in the ammonia soda process or the ammonium chloride soda process. 4,060,389, Cl. 23-252.00A.
Nissan Denshi Company Limited: *See*—
Kazuo, Arai, 4,060,766, Cl. 325-22.000.

Nissan Motor Company, Limited: *See—*
Abe, Eiichi, 4,060,142, Cl. 180-54.00A.
Hata, Yoshitaka; Ikeura, Kenji; and Ozeki, Masaaki, 4,060,065, Cl. 123-119.00A.
Minami, Hidehiro; and Kamino, Hideo, 4,060,064, Cl. 123-119.0EC.
No Flame Process, Inc.: *See—*
Williford, Danny Franklin, 4,060,204, Cl. 241-74.000.
Noah, James D. Identification sticker. 4,059,912, Cl. 40-2.00R.
Nobusawa, Tsukumo, to Asahi Kogaku Kogyo Kabushiki Kaisha. Automatic focusing system employing two variable frequency oscillators. 4,060,325, Cl. 354-25.000.
Nodet-Gougis (Societe de droit francais): *See—*
Grataloup, Xavier Roger, 4,060,181, Cl. 222-193.000.
Nohmura, Ryotaro; Tazaki, Eiji; and Sato, Akio, to Taiyo Kogyo Company Limited. Shielding tent. 4,060,119, Cl. 160-266.000.
Noiles, Douglas G., to United States Surgical Corporation. Surgical fastening method and device therefor. 4,060,089, Cl. 128-325.000.
Nordson Corporation: *See—*
Algeri, Harvey R.; and Stumphauzer, William C., 4,060,052, Cl. 118-2.000.
Noro, Yoshihisa: *See—*
Yoshikawa, Ikuji; Noro, Yoshihisa; and Okaneya, Junji, 4,060,421, Cl. 106-38.50D.
Norrie, David Gordon: *See—*
Demaine, David George Anthony; and Norrie, David Gordon, 4,060,307, Cl. 350-96.00B.
Norris, John Henry, to Linotype-Paul Limited. Take-up spools. 4,060,210, Cl. 242-71.100.
Norton Company: *See—*
Hofmann, Harriet E., 4,060,424, Cl. 106-55.000.
Noschese, Fred J. Stencil sheet holder. 4,060,030, Cl. 101-127.100.
Noshi, Yoshibumi: *See—*
Sugahara, Yujiro; Noshi, Yoshibumi; Naito, Hiroyuki; and Nakamura, Seiichi, 4,060,508, Cl. 260-23.0XA.
Nowak, Herbert: *See—*
Schacht, Erich; Mehrhof, Werner; Jonas, Rochus; Nowak, Herbert; and Simane, Zdenek, 4,060,609, Cl. 424-244.000.
Numata, Saburo; and Fujino, Shinichiro, to Fuji Photo Optical Co., Ltd. Potentiometer. 4,060,788, Cl. 338-128.000.
N.V. Weefautomaten Picanol: *See—*
Steverlynck, Patrick A., 4,060,104, Cl. 139-188.00R.
Nychka, Henry R.: *See—*
Peterson, James Oliver; Sukornick, Bernard; Sweeney, Richard Francis; Nychka, Henry R.; Eibeck, Richard E.; and Berenbaum, Morris B., 4,060,555, Cl. 260-586.00R.
Oce-van der Grinten, N.V.: *See—*
van Nunen, Petrus J. M.; and van Barneveld, Willem, 4,060,415, Cl. 96-1.800.
O'Day, William R., Jr.; Bensky, Norman D.; and LeBlanc, James D., to Kennecott Copper Corporation. Composite wire. 4,060,653, Cl. 427-423.000.
Offermanns, Heribert: *See—*
Asinger, Friedrich; Offermanns, Heribert; and Ghyczy, Miklos, 4,060,548, Cl. 260-534.00S.
Ogasawara, Takeshi: *See—*
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Ohfuji, Mitsuo: *See—*
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Ohkubo, Tetsuo: *See—*
Nakatsukasa, Kazuo; Murata, Kazuo; Ohkubo, Tetsuo; Yurugi, Masayoshi; and Takahashi, Shinobu, 4,060,851, Cl. 364-900.000.
Ohmi, Hidehiko, to Japan Crown Cork Co., Ltd. Apparatus for dispensing cap lining material. 4,060,053, Cl. 118-215.000.
Ohms, Edward Joseph: *See—*
Gee, James Edgar; and Ohms, Edward Joseph, 4,060,289, Cl. 308-187.100.
Ohta, Wasaburo; and Watanabe, Tatsuya, to Kabushiki Kaisha Ricoh. Method for forming a transparent protective coating on a photograph or the like. 4,060,441, Cl. 156-234.000.
Ohya, Masaki; and Hoshino, Mitsuru, to Kureha Kagaku Kogyo Kabushiki Kaisha. Method for preventing or eliminating water-absorption whitening of a molded article containing an acrylonitrile polymer or copolymer. 4,060,650, Cl. 427-161.000.
Okaneya, Junji: *See—*
Yoshikawa, Ikuji; Noro, Yoshihisa; and Okaneya, Junji, 4,060,421, Cl. 106-38.50D.
Oki Electric Industry Co., Ltd.: *See—*
Ataka, Hisashi; Wako, Shigeo; and Ushio, Shintaro, 4,060,699, Cl. 179-18.0GF.
Nakatsukasa, Kazuo; Murata, Kazuo; Ohkubo, Tetsuo; Yurugi, Masayoshi; and Takahashi, Shinobu, 4,060,851, Cl. 364-900.000.
Okuyama, Toshiaki; and Kubota, Yuzuru, to Hitachi, Ltd. Control system for commutatorless motor. 4,060,753, Cl. 318-175.000.
Oldendorf, Christian: *See—*
Melcher, Franz Josef; and Oldendorf, Christian, 4,060,771, Cl. 330-59.000.
Oldendorf, Eric W. Method and apparatus for skateboard suspension system. 4,060,253, Cl. 280-87.04A.
Oldengott, Hans, to Dr. C. Otto & Comp. G.m.b.H. Process for partial restoration of a coke oven battery. 4,059,885, Cl. 29-401.00F.
Olin Corporation: *See—*
Monk, Donald Wayne, 4,060,684, Cl. 536-56.000.
Olsson, Billy Erik: *See—*
Kunkle, James Raymond; and Olsson, Billy Erik, 4,060,296, Cl. 339-17.0CF.
Olsson, Karl Olof; and Wildheim, Jorgen, to Stal-Laval Turbin AB. Balancing device and method for a rotating body. 4,060,707, Cl. 219-121.0LM.
Olstowski, Franciszek, to Dow Chemical Company, The. Solid, rapid-setting, rigid polyurethanes. 4,060,509, Cl. 260-30.60R.
Olympic Fastening Systems, Inc.: *See—*
Nance, Frank B., 4,059,980, Cl. 72-391.000.
O'Neil, Thomas, Sr. Liquid dispensing container. 4,060,184, Cl. 222-501.000.
Ono, Minoru; and Momoi, Toshimitu, to Hitachi, Ltd. Semiconductor device and a method of making the same. 4,060,827, Cl. 357-54.000.
Onoda Cement Company Limited: *See—*
Harada, Yutaka; Itai, Noriyuki; Ucikawa, Hiroshi; Kato, Hajime; Sato, Katutoshi; and Itoh, Akira, 4,060,425, Cl. 106-90.000.
Onyshkevych, Lubomyr Stephen, to RCA Corporation. Transducer arrangement for a surface acoustic wave device to inhibit the generation of multiple reflection signals. 4,060,833, Cl. 358-188.000.
Ootsu, Fumio. Transducer for conversion of sea water-energy. 4,060,344, Cl. 417-330.000.
Optotechnik Heine KG: *See—*
Heine, Helmut A.; Schmidt, Otto H.; and Rosenbusch, Helmut W., 4,060,724, Cl. 362-32.000.
Orkin, Stanley S., to Kamatics Corporation. Bearing seal and method of forming same. 4,060,287, Cl. 308-72.000.
Oronzio de Nora Impianti Elettrochimici S.p.A.: *See—*
Giuffre, Luigi; de Nora, Vittorio; and Spaziante, Placido, 4,060,473, Cl. 204-253.000.
Orsinger, Winston A.: *See—*
Tress, Norwood E.; and Orsinger, Winston A., 4,060,228, Cl. 271-14.000.
Orth, Dieter: *See—*
Gante, Joachim; Kurmeier, Hans-Adolf; Orth, Dieter; Schacht, Erich; and Wild, Albrecht, 4,060,633, Cl. 424-304.000.
Ortho Pharmaceutical Corporation: *See—*
Kanojia, Ramesh M., 4,060,604, Cl. 424-195.000.
Orthwein, William C. Clip-on dental restoration and tools for removing same. 4,059,900, Cl. 32-5.000.
Osaka Soda Co. Ltd.: *See—*
Yokota, Noriyuki; Tokuda, Shingo; Ito, Yoshiro; and Itaya, Kenji, 4,060,465, Cl. 204-128.000.
Osborne, Ray L., to English, Milton. Apparatus for removing an ignition key cylinder. 4,059,883, Cl. 29-259.000.
Osborne, Robert L., to Westinghouse Electric Corporation. Method and apparatus for testing the movability of valve plugs. 4,059,960, Cl. 60-646.000.
Oskar Schleicher, Firma: *See—*
Seiler, Wolfgang, 4,060,101, Cl. 139-65.000.
Oswald, Gerald L.: *See—*
Postupack, Constantine; Borg, David G.; Junk, Norman M.; Oswald, Gerald L.; and Bowman, Arthur F., 4,060,033, Cl. 102-24.00R.
Outlaw, Benjamin T.: *See—*
Redmore, Derek; and Outlaw, Benjamin T., 4,060,553, Cl. 260-559.00A.
Ovutime, Inc.: *See—*
Schuster, Samuel R., 4,059,986, Cl. 73-54.000.
Owens-Corning Fiberglas Corporation: *See—*
Lin, Kingso C.; and Hammond, Donald J., 4,060,658, Cl. 428-378.000.
Owens, Frances R. Sign assembly. 4,059,915, Cl. 40-125.00H.
Oxford, Keith E. Automatic etching system. 4,060,097, Cl. 137-93.000.
Oy Stromberg AB: *See—*
Panu, Kalevi, 4,060,759, Cl. 323-60.000.
Oy W. Rosenlew AB: *See—*
Puurunen, Juhani, 4,060,183, Cl. 222-442.000.
Ozeki, Masaaki: *See—*
Hata, Yoshitaka; Ikeura, Kenji; and Ozeki, Masaaki, 4,060,065, Cl. 123-119.00A.
P. R. Mallory & Co. Inc.: *See—*
Dey, Arabinda N., 4,060,673, Cl. 429-192.000.
Dey, Arabinda N.; and Holmes, Robert W., 4,060,676, Cl. 429-217.000.
Packaging Corporation of America: *See—*
Hildebrand, Larry R.; and Pausinger, Siegfried K., 4,060,169, Cl. 206-289.000.
Padley, Frederick Bolton: *See—*
Bringi, Naganathan Viswanath; and Padley, Frederick Bolton, 4,060,646, Cl. 426-607.000.
Page, William H., Jr. Guard rail device. 4,060,268, Cl. 293-62.000.
Palazzolo, Salvatore E.; and McCaskey, Harold O., Jr., to Westinghouse Electric Corporation. High yield saturating paper. 4,060,450, Cl. 162-141.000.
Palms, Joseph X. Anchored transportation device. 4,060,036, Cl. 105-368.00T.
Pampel, Helmut, to Bison-werke Bahre & Greten GmbH & Co. KG. Process for the production of shaped components of wood material, especially boards, bound with a hydraulic binder, preferably cement. 4,060,580, Cl. 264-109.000.
Pan, Peter N. Y.; and Hernandez, Rafael J., to Continental Group, Inc., The. Pulsed power application system. 4,060,647, Cl. 427-21.000.
Panagiotoulis, Georgios. Blade and improved holder for it. 4,059,891, Cl. 30-50.000.

Pang, Peter: *See—*
Davis, Lee; and Pang, Peter, 4,060,844, Cl. 361-96.000.
Panu, Kalevi, to Oy Stromberg AB. Tube-insulated shell-core current transformer. 4,060,759, Cl. 323-60.000.
Paolini, Laurent, to Naphtachimie. Process for joining tubular members of great length. 4,060,190, Cl. 228-2.000.
Papafingos, Pandelis N.; and Lance, Richard T., to Alumax Mill Products, Inc. Recovering chloride flux salts for aluminum. 4,060,118, Cl. 159-49.000.
Papakube Corporation: *See—*
Nelson, Gerald B., 4,060,363, Cl. 425-147.000.
Pappas, James. Ashtray and extinguisher. 4,060,092, Cl. 131-236.000.
Pappo, Raphael: *See—*
Collins, Paul W.; and Pappo, Raphael, 4,060,691, Cl. 560-121.000.
Parker, Dane K., to Goodyear Tire & Rubber Company, The. Preparation of antioxidants. 4,060,556, Cl. 260-590.00R.
Paroty, Jean-Marie, to Societe Franco-Hispano-Americaine (FRANCISPAM). Gas lighter. 4,060,373, Cl. 431-135.000.
Pascucci, Gregory A.; Krishnaiyer, Ramesh; and Pridemore, Donald Floyd, to Johnson Controls, Inc. Control system employing a programmable multiple channel controller for transmitting control signals over electrical power lines. 4,060,735, Cl. 307-3.000.
Patterson, James A. Swimming pool gutter. 4,059,856, Cl. 4-172.170.
Patzer, Michael D.: *See—*
Morrison, Charles F., Jr.; Harris, Frank W.; and Patzer, Michael D., 4,060,088, Cl. 128-303.170.
Paul, Henry Neil, 3rd, to Thiokol Corporation. Curable liquid polysulfide polymer based sealants. 4,060,570, Cl. 260-889.000.
Paulik, Frank E.; Hershman, Arnold; Knox, Walter R.; and Roth, James F., to Monsanto Company. Production of dicarboxylic acids. 4,060,547, Cl. 260-532.000.
Pausinger, Siegfried K.: *See—*
Hildebrand, Larry R.; and Pausinger, Siegfried K., 4,060,169, Cl. 206-289.000.
Pavese, John R. Sheeting installation system. 4,059,964, Cl. 61-41.00A.
Pavlovic, Gary Frank: *See—*
Hentz, LeRoy Richard; Pavlovic, Gary Frank; Scarafino, Angelo James; and Seksinsky, John Joseph, 4,060,377, Cl. 432-50.000.
Peachey, Cyril John, to Peachey, Cyril John; and Peachey, Gwendoline Nora. Pressure actuated continuous switch. 4,060,705, Cl. 200-153.00M.
Peachey, Gwendoline Nora: *See—*
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Peacock, Kenneth: *See—*
McGuire, Thomas M.; and Peacock, Kenneth, 4,060,664, Cl. 428-336.000.
Peasley, Gerald J. Harvester apparatus. 4,059,943, Cl. 56-327.00A.
Pekrul, Paul J.; and Thiele, Alfred W., to Rockwell International Corporation. Method and apparatus for automatic abnormal events monitor in operating plants. 4,060,716, Cl. 364-576.000.
Pelosi, Michael H., Jr. Air distribution ceiling. 4,060,025, Cl. 98-40.0DL.
Pennwalt Corporation: *See—*
Shetty, Bola Vithal, 4,060,526, Cl. 260-268.0PH.
Pennzoil Company: *See—*
Sardisco, John B.; and Drechsel, Erhart Karl, 4,060,586, Cl. 423-167.000.
Penrod, John K., to Power Management Corporation. Cooling arrangement for electrical power contactor. 4,060,847, Cl. 361-387.000.
Peredi, Karoly, to Energiagazdalkodasi Intezet. Method of firing and furnace therefor. 4,060,376, Cl. 432-24.000.
Peredi, Karoly, to Energiagazdalkodasi Intezet. Method of firing and furnace therefor. 4,060,378, Cl. 432-96.000.
Perfection Corporation: *See—*
Alewitz, Sam, 4,060,472, Cl. 204-197.000.
Perkin-Elmer Corporation, The: *See—*
Golay, Marcel J. E., 4,060,713, Cl. 364-416.000.
Scott, Larkin B., 4,060,715, Cl. 364-557.000.
Personal Communications, Inc.: *See—*
Yevick, George Johannus, 4,060,317, Cl. 353-27.00R.
Petersen, Arthur W.: *See—*
Schoenholz, Daniel; and Petersen, Arthur W., 4,060,494, Cl. 252-105.000.
Peterson, James O.: *See—*
Sweeney, Richard F.; and Peterson, James O., 4,060,469, Cl. 204-163.00R.
Peterson, James Oliver; Sukornick, Bernard; Sweeney, Richard Francis; Nychka, Henry R.; Eibeck, Richard E.; and Berenbaum, Morris B., to Allied Chemical Corporation. Process for the production of chlorofluorinated aliphatic ketones. 4,060,555, Cl. 260-586.00R.
Peterson, Robert S.: *See—*
Chabot, Daniel H.; Peterson, Robert S.; and Plumer, Roy D., 4,060,117, Cl. 151-43.000.
Petrolite Corporation: *See—*
Redmore, Derek; and Outlaw, Benjamin T., 4,060,553, Cl. 260-559.00A.
Woods, John Henry; and Graves, Toby R., 4,060,569, Cl. 260-683.15R.
Pez, Guido P.: *See—*
Pieters, Wim J. M.; Carlson, Emery J.; and Pez, Guido P., 4,060,499, Cl. 252-432.000.
Pfizer Inc.: *See—*
Bright, Gene Michael, 4,060,524, Cl. 260-256.50R.
Dirlam, John P., 4,060,523, Cl. 260-250.0QN.
Pfleiderer, Werner; Arnold, Friedrich; and Haussermann, Richard, to Keiper Trainingsysteme GmbH & Co. Ergometer with automatic load control system. 4,060,239, Cl. 272-73.000.
Phadke, Mukund A.: *See—*
Bowers, Paul E.; and Phadke, Mukund A., 4,060,845, Cl. 361-149.000.
Philadelphia Suburban Corporation: *See—*
Chiesa, Peter J., Jr., 4,060,132, Cl. 169-47.000.
Chiesa, Peter J., Jr., 4,060,489, Cl. 252-3.000.
Philip A. Hunt Chemical Corporation: *See—*
Nelson, Warren A., 4,060,447, Cl. 156-642.000.
Philipp, Adolf H.; and Jirkovsky, Ivo L., to Ayerst McKenna and Harrison Ltd. 1,4-Dihydro-4-oxo-benzothiopyrano (4,3-b)pyridine-2-carboxylates and derivatives. 4,060,619, Cl. 424-256.000.
Philipp, Wilfried. Printing method and apparatus for performing the printing method. 4,060,031, Cl. 101-163.000.
Phillips Petroleum Company: *See—*
Archerd, Paul H., 4,060,001, Cl. 73-421.50R.
Doss, Richard C.; and Murtha, Timothy P., 4,060,519, Cl. 260-79.000.
Irvin, Howard B., 4,060,520, Cl. 260-79.100.
Phillips, William A.: *See—*
Gentry, Charles B.; and Phillips, William A., 4,060,371, Cl. 431-75.000.
Pierce, David R.: *See—*
Nelson, Carl R.; Pierce, David R.; Depew, Noel F.; and Harp, Marlyn F., 4,060,161, Cl. 197-1.00R.
Piereder, Ludwig, to L. P. Machinery Ltd. Continuous flow, oscillating piston meat pump. 4,060,349, Cl. 417-482.000.
Pierre Fabre SA: *See—*
Stenger, M. Antoine; Cousse, Henri; and Mouzin, M. Gilbert, 4,060,637, Cl. 424-324.000.
Piet, Meyer; and Giles, Dean Gaylord, to Futurecraft Corporation. Controlled environment work enclosure. 4,059,903, Cl. 32-40.00R.
Pieters, Wim J. M.; Carlson, Emery J.; and Pez, Guido P., to Allied Chemical Corporation. Copper chloride/boron nitride catalyst for substitution chlorination. 4,060,499, Cl. 252-432.000.
Piezo Technology Inc.: *See—*
Tiersten, Harry Frank; and Smythe, Robert Chastain, 4,060,777, Cl. 333-72.000.
Pigeaud, Jean-Marie: *See—*
Masure, Daniel; Guillaumont, Jacques; and Pigeaud, Jean-Marie, 4,060,474, Cl. 204-270.000.
Pigeon, Norbert G. Tow truck dolly. 4,060,258, Cl. 280-638.000.
Pimbley, Walter Thornton: *See—*
Mako, John; and Pimbley, Walter Thornton, 4,060,812, Cl. 346-75.000.
Pinch, Harry Louis; and Moss, Herbert Irwin, to RCA Corporation. Composite sputtering method. 4,060,471, Cl. 204-192.0SP.
Pisani, Luigi, to Rockwell-Rimoldi S.p.A. Fabric cutting machine for producing strips from tubular material. 4,059,874, Cl. 29-2.160.
Pitkin, Sheldon; Varcadipane, Richard; and Poppe, Walter H. Prefabricated fencing system. 4,060,222, Cl. 256-50.000.
Pitney Bowes Inc.: *See—*
Check, Frank Thomas, Jr., 4,060,720, Cl. 235-309.000.
Plastomedical Sciences, Inc.: *See—*
Steckler, Robert, 4,060,678, Cl. 526-260.000.
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Poister, Clarence E. Free standing toilet stool ventilating device. 4,059,857, Cl. 4-213.000.
Polaroid Corporation: *See—*
Ciecluch, Ronald F. W.; Luhowy, Roberta R.; Meneghini, Frank A.; and Rogers, Howard G., 4,060,417, Cl. 96-3.000.
Dionne, Leonard J., 4,060,817, Cl. 354-198.000.
Fanciullo, Ralph D., 4,060,669, Cl. 429-152.000.
Gerber, Arthur M.; and Walworth, Vivian K., 4,060,419, Cl. 96-94.00R.
Zinchuk, Michael, 4,060,426, Cl. 136-89.0NB.
Poletto, John Frank: *See—*
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Poliak, John M.; Lopez, Juan M.; and Gritz, Robert W., to Leviton Manufacturing Co., Inc. Loop forming gauge and method of forming a loop. 4,060,305, Cl. 339-269.000.
Poliak, John N., to Leviton Manufacturing Co., Inc. Sheet metal screw. 4,060,020, Cl. 85-1.00L.
Pollack, Joel M.; and Flannery, John B., to Xerox Corporation. Imaging method. 4,060,316, Cl. 353-20.000.
Pollak, Robert J., to Allis-Chalmers Corporation. Hydraulic accumulator for use with gyratory crushers and combination of such accumulator with a gyratory crusher. 4,060,205, Cl. 241-211.000.
Polysius AG: *See—*
Weber, Paul; Mollenkopf, Hans; Henning, Kurt; Heinemann, Otto; Schmits, Heinz-Herbert; Rother, Wolfgang; Ritzmann, Horst; Wurr, Jurgen; Krutzner, Karl, Jr.; Schossler, Werner; Goldmann, Wolf; and Schepers, Georg, 4,060,375, Cl. 432-14.000.

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Maeyerspeer, Bernhard, 4,060,278, Cl. 297-386.000.

Portec, Inc.: *See*—
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Portescap: *See*—
Heyraud, Marc, 4,060,746, Cl. 310-177.000.

Post Office: *See*—
Birnie, Peter Alexander, 4,060,698, Cl. 179-15.0AT.
Cox, William Edward; and Lee, Frank James, 4,060,138, Cl. 173-49.000.

Postupack, Constantine; Berg, David G.; Junk, Norman M.; Oswald, Gerald L.; and Bowman, Arthur F., to Atlas Powder Company. Delay booster assembly. 4,060,033, Cl. 102-24.00R.

Potente, Demetri: *See*—
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Potter, Sydney Ralph: *See*—
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Povall, Gerald W.: *See*—
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Powell, Kenneth F.: *See*—
Miertschin, Gary N.; and Powell, Kenneth F., 4,060,454, Cl. 176-84.000.

Power Management Corporation: *See*—
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Powers, John R., to Texaco Inc. Methods for forming bubble cap assemblies for a gas and liquid contact apparatus. 4,059,877, Cl. 29-157.00R.

PPG Industries, Inc.: *See*—
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Prak, Jan Willem L., to Intersil, Inc. One button digital watch and method of setting the display. 4,059,955, Cl. 58-23.00R.

Pratt, Roy E.: *See*—
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Preh-Elektrofeinmechanische Werke - Jakob Preh Nachf: *See*—
Achtmann, Walfried; and Hochgesang, Gerhard, 4,060,789, Cl. 338-183.000.

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Propper Manufacturing Company, Inc.: *See*—
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Pucel, Robert A.; and Statz, Hermann, to Raytheon Company. Low noise read-type diode. 4,060,820, Cl. 357-13.000.

Pugsley, Thomas A.: *See*—
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Pulmac Instruments Ltd.: *See*—
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Puurunen, Juhani, to Oy W. Rosenlew AB. Apparatus for portioning of a solid vegetable raw material. 4,060,183, Cl. 222-442.000.

Pyott-Boone Machinery Corporation: *See*—
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Quenneville, Yves. Lamellar pellicle for thermography. 4,060,654, Cl. 428-1.000.

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Church, Wayne Edward; and Quist, Frederick Fenn, Jr., 4,060,230, Cl. 271-63.000.

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R. Alkan & Cie: *See*—
Hasquenoph, Jean H.; and Coutin, Pierre Fernand, 4,060,213, Cl. 244-137.00R.

R. J. Reynolds Tobacco Company: *See*—
Long, Margaret E., 4,060,456, Cl. 195-31.00F.

R. Jung AG Fabrik fur Prazisionsapparate: *See*—
Behme, Werner; and Berleth, Manfred, 4,060,440, Cl. 156-154.000.

Raasch, Hans, to W. Schlafhorst & Co. Method and device for irregularizing or disturbing a winding pattern in a winding apparatus for cross-wound coils. 4,060,208, Cl. 242-18.100.

Rabenau, Albrecht: *See*—
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Raff, Frederick L.; and Szymanski, Edward, to United States Steel Corporation. Method and apparatus for controlling a gas-producing facility. 4,060,339, Cl. 417-2.000.

Raff, Samuel J., to United States of America, Navy. Method of detecting the presence of an enemy submarine. 4,060,790, Cl. 340-3.00R.

Raghavachari, Srinivas T.: *See*—
Lindberg, Richard M.; and Raghavachari, Srinivas T., 4,060,082, Cl. 128-218.00M.

Rampe, John F., to Rampe Research. Chain finishing system. 4,059,926, Cl. 51-163.100.

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Randolph, Arthur J.; and Boyce, Richard M., to Randolph, Arthur J. Quilting machine. 4,059,889, Cl. 29-706.000.

Ranheim, Donald H., Jr.: *See*—
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Rank Organisation Limited, The: *See*—
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Rank Xerox Ltd.: *See*—
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Ransburg Corporation: *See*—
Bacsanyi, Thomas J.; and Harmon, Edward J., 4,060,003, Cl. 73-483.000.

Rapoport, Henry; and Snyder, Clinton D., to University of California, The Regents of the. Process for preparing 3-alkyl-4-alkoxy-1-naphthols. 4,060,558, Cl. 260-613.00D.

Rapp, Felix, Jr.; and Barron, James M., to DIY-Sol, Inc. Solar heating control system. 4,060,195, Cl. 237-1.00A.

Rapp, Wolfgang; Haas, Karl-Heinz; and Luessem, Heribert, to Ernst Leitz GmbH Wetzlar. Specimen holding device and method of using same. 4,060,388, Cl. 23-230.00R.

Rasmussen, Poul Rodbroe: *See*—
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Raymond International Inc.: *See*—
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Raytheon Company: *See*—
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RCA Corporation: *See*—
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Faulkner, Richard Dale, 4,060,747, Cl. 313-95.000.
Foldes, Peter, 4,060,808, Cl. 343-100.0PE.
Halter, Jerome Barth, 4,060,831, Cl. 358-128.000.
Onyshkevych, Lubomyr Stephen, 4,060,833, Cl. 358-188.000.
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Schade, Otto Heinrich, Jr., 4,060,770, Cl. 330-253.000.

Reactive Metals & Alloys Corporation: *See*—
Jackman, Joseph R., 4,060,407, Cl. 75-58.000.

Reber, Walter, to Kuhn, S.A. Haymaking machine for the tedding and windrowing of fodder. 4,059,944, Cl. 56-370.000.

Reckitt & Colman Products Limited: *See*—
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Redmore, Derek; and Outlaw, Benjamin T., to Petrolite Corporation. Hydroxyalkylaminoalkylamides and preparation and uses thereof. 4,060,553, Cl. 260-559.00A.

Reed, Marion G.; and Jaffe, Joseph, to Chevron Research Company. Hydrocarbon hydroconversion process employing hydroxy-aluminum stabilized catalysts supports. 4,060,480, Cl. 208-111.000.

Rees, Ned: *See*—
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Reinhold, Herbert E., Jr., to Survival Technology, Inc. Heart-lung resuscitator litter unit. 4,060,079, Cl. 128-145.800.

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Resch, Ronald Dale. Self-supporting structural unit having a three-dimensional surface. 4,059,932, Cl. 52-81.000.
Reuter, Franz Gottfried; and Menzel, Tankred Walter, to Reuter Maschinen-and Werkzeugbau GmbH. Rigid electric surface heating element. 4,060,710, Cl. 219-548.000.
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Reuter, Franz Gottfried; and Menzel, Tankred Walter, 4,060,710, Cl. 219-548.000.
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Riedl, Kurt, to Biochemie Gesellschaft m.b.H. 14-Desoxy-14 thiocyanato-acetoxy-mutilin. 4,060,542, Cl. 260-454.000.
Rieger, Werner; Boning, Manfred; Dalferth, Hans; and Smetz, Reinhard. Equalizing head for chain slings. 4,060,269, Cl. 294-78.00A.
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Riffe, Delmar R.; and Young, Robert R., to Westinghouse Electric Corporation. Vane assembly for rotary compressor. 4,060,342, Cl. 417-284.000.
Rilbe, Ulf Christer, to Hiab-Foco Aktiebolag. Double-acting hydraulic cylinder having two pistons arranged for coaxial movement relative thereto. 4,060,221, Cl. 254-93.00R.
Risler, Pierre; Gireau, Jean; Rose, Pierre; and Bisson, Jean-Pierre, to Societe d'Assistance Technique pour Produits Nestle S.A. Dehydrated food product. 4,060,645, Cl. 426-302.000.
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Marquis, Edgar E., 4,059,897, Cl. 29-432.100.
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Robillard, Edward G., to Cincinnati Milacron-Heald Corporation. Grinding machine. 4,059,927, Cl. 51-165.770.
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Heinz, Theodore A., 4,060,315, Cl. 350-289.000.
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Rodewald, Paul G., to Mobil Oil Corporation. Silica-modified zeolite catalyst and conversion therewith. 4,060,568, Cl. 260-682.000.
Roe, Norman P., to Consolidated Products Corporation. Composite strain member for use in electromechanical cable. 4,059,951, Cl. 57-149.000.
Rogachev, Viktor Igorevich; Sukhorukov, Vasily Vasilievich; and Shkatov, Petr Nikolaevich. Eddy current sensor for non-destructive testing the quality of electrically conductive through-hole plating in printed circuit boards. 4,060,760, Cl. 324-2.900.
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Rosemund, Walter Richard; and Rose, Charles Vincent, to Union Carbide Corporation. Polyurethane foam composition and method of making same. 4,060,439, Cl. 156-78.000.
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Rynearson, John L., to Minnesota Mining and Manufacturing Company. Variable cell width recording. 4,060,837, Cl. 360-44.000.
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Sabella, Barney. Device for cleaning bottom of a boat. 4,060,047, Cl. 114-222.000.
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Sakamoto, Kenji; and Kawaai, Osamu, to Sanyo Electric Co., Ltd.; and A & A Japan, Ltd. Press-to-talk transceiver. 4,060,765, Cl. 325-21.000.

Sakamoto, Takashi, to Dainippon Screen Seizo Kabushiki-Kaisha. Method of color correction. 4,060,829, Cl. 358-80.000.

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Samsel, Frank J. Apparatus for cleaning oil spills. 4,060,487, Cl. 210-242.00R.

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Goldsby, Claude W.; and Sandau, Roray J, 4,060,196, Cl. 237-51.000.

Sandoz, Inc.: *See*—
Anderson, Paul L., 4,060,638, Cl. 424-324.000.
Nadelson, Jeffrey, 4,060,533, Cl. 260-345.70R.

Sandoz Ltd.: *See*—
Baumann, Hans-Peter; and Karmann, Hans-Georg, 4,060,387, Cl. 8-169.000.

Sankyo Company Limited: *See*—
Tomita, Kazuo; Murakami, Tadashi; Yamazaki, Yoshio; and Honma, Toyokuni, 4,060,402, Cl. 71-76.000.

Santos, John J., Jr.; and Tassone, Joseph V., to Compo Industries, Inc. Wet latex lasting system. 4,059,861, Cl. 12-145.000.

Sanwa Seiki Kabushiki Kaisha: *See*—
Tomita, Tomiichi, 4,060,201, Cl. 239-553.000.

Sanyo Electric Co., Ltd.: *See*—
Sakamoto, Kenji; and Kawaai, Osamu, 4,060,765, Cl. 325-21.000.

Sapunarov, Ivan Mitrev: *See*—
Stoev, Stoycho Mitrev; Metodiev, Metodi Stoyanov; Kuzev, Lyubomir Vladimirov; Vedrichkov, Petko Georgiev; Sapunarov, Ivan Mitrev; Vassilev, Vassil Vladimirov; Dimitrov, Spas Petkov; Gasharov, Vihar Assenov; Russev, Sheko Kolev; and Mitrev, Kostadin Georgiev, 4,060,481, Cl. 209-170.000.

Sardisco, John B.; and Drechsel, Erhart Karl, to Pennzoil Company. Recovery of fluorides from gypsum. 4,060,586, Cl. 423-167.000.

Sarfati, Roger Gerard: *See*—
Jarreau, Francois-Xavier; and Sarfati, Roger Gerard, 4,060,607, Cl. 424-241.000.

Sarkes Tarzian, Inc.: *See*—
Valdettaro, Alarico A., 4,060,051, Cl. 116-124.10A.

Sartorius-Werke GmbH (und vorm. Gottinger Prazisions-Waagenfabrik GmbH): *See*—
Melcher, Franz Josef; and Oldendorf, Christian, 4,060,771, Cl. 330-59.000.

Sasaki, Takehiko: *See*—
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Sato, Akio: *See*—
Nohmura, Ryotaro; Tazaki, Eiji; and Sato, Akio, 4,060,119, Cl. 160-266.000.

Sato, Hidetaka, to Kansai Paint Company, Limited. Preparation of coating composition of specified color. 4,059,904, Cl. 33-126.70A.

Sato, Hiroshi: *See*—
Yasui, Seimei; and Sato, Hiroshi, 4,060,492, Cl. 252-59.000.

Sato, Katutoshi: *See*—
Harada, Yutaka; Itai, Noriyuki; Ucikawa, Hiroshi; Kato, Hajime; Sato, Katutoshi; and Itoh, Akira, 4,060,425, Cl. 106-90.000.

Sato, Yasushi: *See*—
Hirayama, Kazuhiro; Sato, Yasushi; Tokiwa, Taisuke; Kawakubo, Kazuo; Iwatate, Fujio; and Nakatsui, Hisashi, 4,060,322, Cl. 355-60.000.
Hirayama, Kazuhiro; Sato, Yasushi; Tokiwa, Taisuke; Iwatate, Fujio; Kawakubo, Kazuo; and Nakatsui, Hisashi, 4,060,323, Cl. 355-60.000.

Sato, Yukio; Wada, Seijun; and Matsuzawa, Shigetaka, to Takeda Chemical Industries, Ltd. Serological reagent and preparation thereof. 4,060,597, Cl. 424-12.000.

Satomura, Masato: *See*—
Maekawa, Yukio; Satomura, Masato; and Umehara, Akira, 4,060,685, Cl. 542-413.000.

Satonaka, Koichiro, to Hitachi, Ltd. Semiconductor device having multi-layer wiring structure with additional through-hole interconnection. 4,060,828, Cl. 357-71.000.

Sauer, Abe. Security window guard. 4,059,923, Cl. 49-57.000.

Savin, Nikolai Ivanovich; Ternikova, Tamara Alexandrovna; Filippov, Vladimir Jurievich; and Shiryaev, Vladimir Ivanovich. Shell-and-tube heat exchanger. 4,060,127, Cl. 165-145.000.

Saxby, Willard A.: *See*—
Bickford, John H.; Ranheim, Donald H., Jr.; and Saxby, Willard A., 4,060,137, Cl. 173-12.000.

Saylor, Charles J.: *See*—
Haworth, Richard G.; Saylor, Charles J.; and Wilson, Harold R., 4,060,294, Cl. 339-4.000.

Scarafino, Angelo James: *See*—
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Schabert, Hans-Peter; and Laurer, Erwin, to Kraftwerk Union Aktiengesellschaft. Nuclear reactor installation. 4,060,453, Cl. 176-38.000.

Schacht, Erich; Mehrhof, Werner; Jonas, Rochus; Nowak, Herbert; and Simane, Zdenek, to Merch Patent Gesellschaft mit beschrankter Haftung. Biphenylyl ethers and method of use. 4,060,609, Cl. 424-244.000.

Schacht, Erich: *See*—
Gante, Joachim; Kurmeier, Hans-Adolf; Orth, Dieter; Schacht, Erich; and Wild, Albrecht, 4,060,633, Cl. 424-304.000.

Schade, Max Gunter. Ventilator valve. 4,060,096, Cl. 137-74.000.

Schade, Otto Heinrich, Jr., to RCA Corporation. Differential amplifier. 4,060,770, Cl. 330-253.000.

Schaeffer, Howard John, to Burroughs Wellcome Co. Purine derivatives with repeating unit. 4,060,616, Cl. 424-253.000.

Schafer, Derek J.: *See*—
Morgan, Barry A.; and Schafer, Derek J., 4,060,603, Cl. 424-177.000.

Schafft, Hugo Willy, to Motorola, Inc. High power piezoelectric bender. 4,060,741, Cl. 310-332.000.

Schatzler, Walter: *See*—
Bienert, Horst; Jardin, Hans; and Schatzler, Walter, 4,060,274, Cl. 296-137.00G.

Schaub, Robert Eugene: *See*—
Bernady, Karel Francis; Floyd, Middleton Brawner, Jr.; Poletto, John Frank; Schaub, Robert Eugene; and Weiss, Martin Joseph, 4,060,540, Cl. 260-448.80R.

Scheidl, Franz; and Sommer, Werner, to Hoechst Aktiengesellschaft. Physiologically unobjectionable stabilizer compositions for halogenated polyolefins. 4,060,512, Cl. 260-45.80N.

Schepers, Georg: *See*—
Weber, Paul; Mollenkopf, Hans; Henning, Kurt; Heinemann, Otto; Schmits, Heinz-Herbert; Rother, Wolfgang; Ritzmann, Horst; Wurr, Jurgen; Krutzner, Karl, Jr.; Schossler, Werner; Goldmann, Wolf; and Schepers, Georg, 4,060,375, Cl. 432-14.000.

Schevey, William Russell: *See*—
Nemiroff, Michael; Yue, Hong Jun; and Schevey, William Russell, 4,060,448, Cl. 156-653.000.

Schladitz, Hermann J. Heat transfer between solids and fluids utilizing polycrystalline metal whiskers. 4,060,126, Cl. 165-133.000.

Schlegel, Earl S., to Westinghouse Electric Corporation. High speed high power two terminal solid state switch fired by dV/dt. 4,060,825, Cl. 357-38.000.

Schliebs, Reinhard: *See*—
Kapps, Manfred; Mitschke, Karl-Heinz; and Schliebs, Reinhard, 4,060,571, Cl. 260-970.000.

Schloemann, Ernst Fritz Rudolf August; and Van Hook, Harry Jerrold, to United States of America, Navy. Method for increasing the critical velocity of magnetic bubble propagation in magnetic materials. 4,060,798, Cl. 365-25.000.

Schlueter, Francis Edward: *See*—
Trimble, David Lee; Copley, Russell Dean; Jensen, James Keith; and Schlueter, Francis Edward, 4,059,942, Cl. 56-30.000.

Schmidt, Achim D., to Alveru S. A. Shoe cleaning mat. 4,059,865, Cl. 15-161.000.

Schmidt, Alfred: *See*—
Garber, Alfred; Stonner, Hans-Martin; Wiesner, Paul; Sinclair, Alan; and Schmidt, Alfred, 4,060,591, Cl. 423-352.000.

Schmidt, Arthur H.; Lantzsch, Reinhard; Marhold, Albrecht; Lehment, Klaus-Friedrich; and Staffe, Adolf, to Bayer Aktiengesellschaft. Process for preparing sulfonic acid fluorides. 4,060,549, Cl. 260-543.00F.

Schmidt, Felix Helmut: *See*—
Hrstka, Vladimir; Hubner, Manfred; Kuhr, Manfred; Schmidt, Felix Helmut; and Aumuller, Walter, 4,060,626, Cl. 424-274.000.
Rothe, Werner; Heinemann, Helmut; Schmidt, Felix Helmut; and Betzien, Gunter, 4,060,634, Cl. 424-321.000.

Schmidt, Otto H.: *See*—
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Schmits, Heinz-Herbert: *See*—
Weber, Paul; Mollenkopf, Hans; Henning, Kurt; Heinemann, Otto; Schmits, Heinz-Herbert; Rother, Wolfgang; Ritzmann, Horst; Wurr, Jurgen; Krutzner, Karl, Jr.; Schossler, Werner; Goldmann, Wolf; and Schepers, Georg, 4,060,375, Cl. 432-14.000.

Schmitt, Kirk D.: *See*—
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Schmitzer, Willi; Kisteneich, Heinz; and Proksa, Ferdinand, to Maschinenfabrik Hennecke GmbH. Method for the continuous forming of foam blocks. 4,060,579, Cl. 264-51.000.

Schmuck, Phillip W.: *See*—
Kenneday, John W.; Kinney, Charles W.; Scott, Floyd L., Jr.; and Schmuck, Phillip W., 4,060,131, Cl. 166-315.000.

Schoen, William: *See*—
Dowling, Donald J.; and Schoen, William, 4,059,987, Cl. 73-61.10R.

Schoenholz, Daniel; and Petersen, Arthur W., to Foster D. Snell, Inc. Non-caustic drain cleaner. 4,060,494, Cl. 252-105.000.

Scholz, Hansjurgen; Backhaus, Hans-Gerd; Brambilla, Luigi; and Gimbel, Jurgen, to Daimler-Benz Aktiengesellschaft. Sensor adapted to be triggered by deceleration forces. 4,060,004, Cl. 73-514.000.

Schossler, Werner: *See*—
Weber, Paul; Mollenkopf, Hans; Henning, Kurt; Heinemann, Otto; Schmits, Heinz-Herbert; Rother, Wolfgang; Ritzmann, Horst; Wurr, Jurgen; Krutzner, Karl, Jr.; Schossler, Werner; Goldmann, Wolf; and Schepers, Georg, 4,060,375, Cl. 432-14.000.

Schott, Charles W. Apparatus for making beads. 4,060,356, Cl. 425-8.000.

Schoute, Bernardus A.; and Verhoeven, Gerardus H. Th. M. Burner for the combustion of hydrocarbonates. 4,060,369, Cl. 431-9.000.

Schreiber, August. Waste water aeration device. 4,060,486, Cl. 210-220.000.

Schroder, Karl-Friedrich: *See*—
Grebe, Herbert; Hartwig, Wolfgang; Kohler, Johann; Rothe, Rudolf; and Schroder, Karl-Friedrich, 4,060,394, Cl. 23-284.000.

Schroeder, Fred, to Dow Corning Corporation. Floatable incendiary composition. 4,060,435, Cl. 149-19.200.

Schulz, Heinz: *See*—
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Schulze, Hans: *See*—
Blomer, Alois; and Schulze, Hans, 4,060,075, Cl. 128-90.000.

Schuster, Samuel R., to Ovutime, Inc. Mucus testing processes and devices. 4,059,986, Cl. 73-54.000.

Schweig, Eugene S., Jr.; and Diehl, Marcus I. Tape applicator. 4,060,444, Cl. 156-391.000.

Schweller, John. Apparatus for injection molding. 4,060,226, Cl. 366-75.000.

Scott, Floyd L., Jr.: *See*—
Kenneday, John W.; Kinney, Charles W.; Scott, Floyd L., Jr.; and Schmuck, Phillip W., 4,060,131, Cl. 166-315.000.

Scott, Larkin B., to Perkin-Elmer Corporation, The. Linearized bridge circuitry. 4,060,715, Cl. 364-557.000.

Sedlmair, Gerhard: *See*—
Jungkind, Roland; and Sedlmair, Gerhard, 4,060,257, Cl. 280-626.000.

Seibu Chemical Industry Co., Ltd.: *See*—
Shimizu, Kazufusa; Katsumori, Shigeo; Nishikawa, Tadaaki; Senoo, Keisaku; Sakamaki, Kenji; Fujita, Makio; Tano, Teruo; Takano, Hiroshi; and Komori, Hideo, 4,060,390, Cl. 23-259.100.

Seiler, Claus-Dieter: *See*—
Kotzsch, Hans Joachim; Vahlensieck, Hans-Joachim; and Seiler, Claus-Dieter, 4,060,538, Cl. 260-448.80R.

Seiler, Claus-Dietrich; Vahlensieck, Hans-Joachim; and Amort, Jurgen, to Dynamit Nobel Aktiengesellschaft. Sulfurous organic silicon compounds, a process for their preparation, and their use as adhesivizing agents. 4,060,539, Cl. 260-448.80R.

Seiler, Wolfgang, to Oskar Schleicher, Firma. Double lift, open shed Jacquard loom. 4,060,101, Cl. 139-65.000.

Seksinsky, John Joseph: *See*—
Hentz, LeRoy Richard; Pavlovic, Gary Frank; Scarafino, Angelo James; and Seksinsky, John Joseph, 4,060,377, Cl. 432-50.000.

Senoh Kabushiki Kaisha: *See*—
Hayamizu, Seiji, 4,059,934, Cl. 52-297.000.

Senoo, Keisaku: *See*—
Shimizu, Kazufusa; Katsumori, Shigeo; Nishikawa, Tadaaki; Senoo, Keisaku; Sakamaki, Kenji; Fujita, Makio; Tano, Teruo; Takano, Hiroshi; and Komori, Hideo, 4,060,390, Cl. 23-259.100.

Seton Company: *See*—
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Seybold, Rolf. Friction bearing. 4,060,291, Cl. 308-241.000.

Seydl, Wolfgang: *See*—
Jeserich, Wolfgang-Dieter; Cordes, Claus; Seydl, Wolfgang; and Weiss, Hans-Peter, 4,060,518, Cl. 260-78.00L.

Seyl, Robert G. Method and apparatus for correcting error in corrosion rate measurements. 4,060,461, Cl. 204-1.00T.

Shafer, Leroy: *See*—
Lappington, John P.; and Shafer, Leroy, 4,060,714, Cl. 364-431.000.

Shapiro, Howard E.: *See*—
Merz, Kenneth M.; and Shapiro, Howard E., 4,060,663, Cl. 428-428.000.

Sharp Kabushiki Kaisha: *See*—
Maeda, Hidetoshi; and Sasaki, Takehiko, 4,059,956, Cl. 58-23.00R.

Shatila, Mounir A.; Veeneman, John L.; Lach, John H.; and Harmon, James F., to Ampco Foods Inc. Drive mechanism for dough shaping apparatus. 4,060,367, Cl. 425-311.000.

Shaw, Alan Douglas, to Fanner Pty. Limited, a part interest. Preliminary screening of wooden poles. 4,059,988, Cl. 73-579.000.

Shaw, Jane Elizabeth: *See*—
Chandrasekaran, Santosh Kumar; Urquhart, John; and Shaw, Jane Elizabeth, 4,060,084, Cl. 128-260.000.

Shell Internationale Research Maatschappij B.V.: *See*—
Buiter, Pieter; van der Burgt, Maarten J.; and Van Helden, Henricus J. A., 4,060,397, Cl. 48-197.00R.

Shell Oil Company: *See*—
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Kodama, Jiro K.; Haynes, George R.; and Albert, James R., 4,060,640, Cl. 424-326.000.
McClure, James D.; and Brandenberger, Stanley G., 4,060,565, Cl. 260-671.00C.

Shellhause, Ronald L.: *See*—
Demido, Michael; and Shellhause, Ronald L., 4,060,283, Cl. 303-6.00C.

Shenoy, Umakant Devdas, to DDSA Pharmaceuticals. Substituted hydroxymethyl benzodiazepines. 4,060,608, Cl. 424-244.000.

Sherwood, Theodore R., to United States of America, Navy. Pin loading system. 4,059,890, Cl. 29-739.000.

Shetty, Bola Vithal, to Pennwalt Corporation. 1-Heterocyclic alkyl-1,2,3,4-tetrahydroquinazolinones and analgesic intermediates thereof. 4,060,526, Cl. 260-268.0PH.

Shiba, Motoo: *See*—
Nakamoto, Hiromasa; Nakamoto, Shin-Ichi; Amemiya, Hidemitu; Miyamura, Souji; Shiba, Motoo; and Nakamura, Nobuko, 4,060,527, Cl. 260-279.00R.

Shibamoto, Nobuyori: *See*—
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Shima, Takeo: *See*—
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Shimizu, Kazufusa; Katsumori, Shigeo; Nishikawa, Tadaaki; Senoo, Keisaku; Sakamaki, Kenji; Fujita, Makio; Tano, Teruo; Takano, Hiroshi; and Komori, Hideo, to Niigata Engineering Co., Ltd.; and Seibu Chemical Industry Co., Ltd. Apparatus for producing composts. 4,060,390, Cl. 23-259.100.

Shinada, Shinichi; and Mikoshiba, Shigeo, to Hitachi, Ltd. Flat discharge display panel having positive column discharge and auxiliary anode electrodes. 4,060,749, Cl. 313-484.000.

Shiokawa, Yoichi. Tray for preparing a dentiform model used for an operation on a dental technic. 4,059,902, Cl. 32-11.000.

Shioyama, Atsuo: *See*—
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Shiryaev, Vladimir Ivanovich: *See*—
Savin, Nikolai Ivanovich; Ternikova, Tamara Alexandrovna; Filippov, Vladimir Jurievich; and Shiryaev, Vladimir Ivanovich, 4,060,127, Cl. 165-145.000.

Shkatov, Petr Nikolaevich: *See*—
Rogachev, Viktor Igorevich; Sukhorukov, Vasily Vasilievich; and Shkatov, Petr Nikolaevich, 4,060,760, Cl. 324-2.900.

Shoji, Ota. Earring having magnetically secured displaceable ornament for facilitating telephoning. 4,059,971, Cl. 63-14.00R.

Siden, Dennis, to Raychem Corporation. Deformable wire stripper. 4,059,892, Cl. 30-90.100.

Sidney, James T. Portable collapsible scaffold structure. 4,060,148, Cl. 182-2.000.

Siegler, Marcel, to Seton Company. Manufacture of leather. 4,060,384, Cl. 8-94.270.

Siemens Aktiengesellschaft: *See*—
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Jantsch, Ottomar; Feigt, Ingmar; and Willig, Wolf Rudiger, 4,060,822, Cl. 357-30.000.
Rosenberger, Dieter, 4,060,732, Cl. 250-432.00R.
Voss, Peter, 4,060,826, Cl. 357-38.000.

Siements Aktiengesellschaft: *See*—
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Silent Sentry, Inc.: *See*—
Cole, Donald G., 4,060,704, Cl. 200-61.620.

Simane, Zdenek: *See*—
Schacht, Erich; Mehrhof, Werner; Jonas, Rochus; Nowak, Herbert; and Simane, Zdenek, 4,060,609, Cl. 424-244.000.

Simeth, Claus, to Roland Offsetmaschinenfabrik Faber & Schleicher AG. Device for the smooth and flutter-free feeding of sheets on sheet-fed machines, particularly offset printing presses. 4,060,238, Cl. 271-276.000.

Simon-Hartley Limited: *See*—
Austin, Eric Paul; and Allanson, John Trevor, 4,060,484, Cl. 210-80.000.

Simonsson, Sven Bertil, to Aktiebolaget Electrolux. Fill indicator for a vacuum cleaner dust collector. 4,060,050, Cl. 116-114.0AD.

Sims, Larry Averett; and Kelley, William John, to Mattel, Inc. Simulated firecracker. 4,059,917, Cl. 46-196.000.

Sinclair, Alan: *See*—
Garber, Alfred; Stonner, Hans-Martin; Wiesner, Paul; Sinclair, Alan; and Schmidt, Alfred, 4,060,591, Cl. 423-352.000.

Sinclair, Richard G.; and Cremeans, George E., to Goodyear Tire & Rubber Company, The. Pigmented, particulate powder coating composition. 4,060,511, Cl. 260-34.200.

Singer Company, The: *See*—
Gdovin, David Paul, 4,060,835, Cl. 358-238.000.
Kron, Gerald Joseph, 4,059,909, Cl. 35-12.00E.
Vahle, Erwin; and Hartig, Arnold, 4,060,045, Cl. 112-235.000.

Sinjou, Johannes Petrus: *See*—
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Sitek, George J., to Leco Corporation. Acid tester. 4,060,717, Cl. 364-497.000.

SKF Industrial Trading and Development Company B.V.: *See*—
Arsenius, Torsten Henry; and Bildtsen, Sven Christian, 4,060,288, Cl. 308-73.000.

Skinner, Dale D.: *See*—
Jones, Charles H.; and Skinner, Dale D., 4,060,791, Cl. 340-3.00C.

Skinner, Mark, to Chore-Time Equipment, Inc. Poultry cage structure. 4,060,055, Cl. 119-48.000.

Slejko, Frank L., to Rohm and Haas Company. Polymerization inhibitors for N-substituted aminoalkyl acrylic monomers. 4,060,529, Cl. 260-307.0FA.

Sliger, Boyd P., to Robertshaw Controls Company. Vent valve arrangement and method of making the same. 4,059,881, Cl. 29-157.10R.

Slusarski, Ronald S.: *See*—
Chmura, William J.; Slusarski, Ronald S.; and Burk, Charles B., 4,059,879, Cl. 29-148.40R.

Smalley, Edmund W.; Kurtz, Bruce Edward; and Bandyopadhyay, Bhaskar, to Allied Chemical Corporation. Removal of chloroprenes from ethylene dichloride. 4,060,460, Cl. 203-29.000.
Smetz, Reinhard: *See—*
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Smid, Joost: *See—*
van Heel, Hubertus Johannes Gerardus; Bruins, Victor Leonard; and Smid, Joost, 4,060,391, Cl. 23-264.000.
Smith Company, The: *See—*
Ashton, Shirley B., 4,059,862, Cl. 15-53.0AB.
Smith, George Edwin, to Union Carbide Corporation. Method for converting intermittent to constant refuse flow. 4,060,167, Cl. 198-622.000.
Smith, George Windsor, to Girling Limited. Disc brakes caliper and support structure. 4,060,154, Cl. 188-73.300.
Smith, Glenn S.: *See—*
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Smith Kline & French Laboratories Limited: *See—*
Durant, Graham John; Emmett, John Colin; and Ganellin, Charon Robin, 4,060,621, Cl. 424-263.000.
Smith, Michael W.: *See—*
Houck, Staley J.; and Smith, Michael W., 4,060,445, Cl. 156-414.000.
Smith, Stuart B., to Foster Grant Co., Inc. Apparatus for pre-expanding and molding expandable thermoplastic polymer particles. 4,060,354, Cl. 425-4.00R.
Smith, Walton J. Method for improving the stability of seeds. 4,059,908, Cl. 34-15.000.
SmithKline Corporation: *See—*
Berges, David A., 4,060,610, Cl. 424-246.000.
Smiths Industries Limited: *See—*
McAinsh, Kenneth G., 4,060,094, Cl. 136-230.000.
Smythe, Robert Chastain: *See—*
Tiersten, Harry Frank; and Smythe, Robert Chastain, 4,060,777, Cl. 333-72.000.
Snyder, Clinton D.: *See—*
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Societa Nazionale Industria Applicazioni Viscosa S.p.A.: *See—*
Derail, Yves C.; and Dupeuble, Jean-Claude, 4,059,948, Cl. 57-77.330.
Societe Anonyme de Telecommunications: *See—*
Allemandou, Philippe Marie; and Beaudet, Didier Marcel, 4,060,775, Cl. 333-71.000.
Devimeux, Daniel Pierre Yvon; and Stouls, Francois-Xavier Antoine, 4,060,832, Cl. 358-133.000.
Societe Anonyme dite: Etablissement Genoud & Cie: *See—*
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Societe d'Assistance Technique pour Produits Nestle S.A.: *See—*
Risler, Pierre; Gireau, Jean; Rose, Pierre; and Bisson, Jean-Pierre, 4,060,645, Cl. 426-302.000.
Societe de Traction et D'Electricite S.A.: *See—*
Carteus, Marc Felix Maurice; De Bruyne, Yvrs Marie Grovgrs; Lemmens, Jean Pierre Gustaaf Rosa; and Stubbe, Elie Jozef, 4,060,057, Cl. 122-451.00R.
Societe d'Etudes et de Developpement des Aeroglisseurs Marins, Terrestres et Amphibies S.E.D.A.M.: *See—*
Guienne, Paul; Herrouin, Guy; Lafont, Andre; Bertin, Jean, deceased; Bertin, Michel; Bertin, Laurent; Bertin, Philippe; Midy nee Bertin, Catherine; Gonzalez-Camino nee Bertin, Francoise; and Bertin nee Loustau, Genevieve, heirs, 4,060,147, Cl. 180-121.000.
Societe Franco-Hispano-Americaine (FRANCISPAM): *See—*
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Societe Immobiliere et Financiere Suchet Alfort (S.I.F.S.A.): *See—*
Gras, Elie, 4,060,364, Cl. 425-174.000.
Societe Lignes Telegraphiques et Telephoniques: *See—*
Ernei, Herbert, 4,060,774, Cl. 333-71.000.
Societe Paulstra: *See—*
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Sogo Pharmaceutical Company Limited: *See—*
Uchikuga, Saburo; and Kuroki, Masataka, 4,060,551, Cl. 260-561.00S.
Solar Energy Dynamics Corporation: *See—*
Chayet, Emil L., 4,060,071, Cl. 126-271.000.
Solar Industries, Inc.: *See—*
Harter, Donald Gerton, 4,060,070, Cl. 126-271.000.
Solury, Thomas F. Coaxial cable cutting tool. 4,059,893, Cl. 30-90.100.
Sommer, Richard: *See—*
vor der Bruck, Dieter; Sommer, Richard; and Wolfrum, Gerhard, 4,060,521, Cl. 260-165.000.
Sommer, Werner: *See—*
Scheidl, Franz; and Sommer, Werner, 4,060,512, Cl. 260-45.80N.
Sonderegger, Hans Conrad: *See—*
Engeler, Paul; Baumgartner, Hans Ulrich; Dubendorfer, Ulrich; and Sonderegger, Hans Conrad, 4,059,999, Cl. 73-419.000.
Sony Corporation: *See—*
Nakamura, Tokio, 4,060,596, Cl. 423-633.000.
Sotoma, Koichi, to Kewpie Kabushiki Kaisha; and Toyo Shokuhin Kikai Kabushiki Kaisha. Filling quantity regulating system in container filling apparatus. 4,060,109, Cl. 141-83.000.
Sowards, Norman K., to Energy Products of Idaho. Low pollution incineration of solid waste. 4,060,041, Cl. 110-8.00F.
Spalten, Robert. Porcelain fused to metal denture tooth retainer. 4,059,901, Cl. 32-8.000.
Spaziante, Placido: *See—*
Giuffre, Luigi; de Nora, Vittorio; and Spaziante, Placido, 4,060,473, Cl. 204-253.000.
Speiser, Jeffrey M., to United States of America, Navy. Beam former using bessel sequences. 4,060,850, Cl. 364-819.000.
Sperry Rand Corporation: *See—*
Leh, David T., 4,059,888, Cl. 29-629.000.
Matthews, Hugh B., 4,059,959, Cl. 60-641.000.
Sprague Electric Company: *See—*
Coleman, James H., 4,060,649, Cl. 427-79.000.
Spresny, Sharon. Oven cleaning implement. 4,059,864, Cl. 15-105.000.
Spring, David John: *See—*
Watson, Hugh R.; Rowsell, David G.; and Spring, David John, 4,060,091, Cl. 131-9.000.
Staffe, Adolf: *See—*
Schmidt, Arthur H.; Lantzsch, Reinhard; Marhold, Albrecht; Lehment, Klaus-Friedrich; and Staffe, Adolf, 4,060,549, Cl. 260-543.00F.
Stahlecker, Fritz: *See—*
Bottcher, Dieter; Schulz, Heinz; and Stahlecker, Fritz, 4,059,946, Cl. 57-34.00R.
Stahlecker, Gerd, 4,059,947, Cl. 57-58.890.
Stahlecker, Gerd, to Stahlecker, Fritz; and Stahlecker, Hans. Open-end spinning unit. 4,059,947, Cl. 57-58.890.
Stahlecker, Hans: *See—*
Bottcher, Dieter; Schulz, Heinz; and Stahlecker, Fritz, 4,059,946, Cl. 57-34.00R.
Stahlecker, Gerd, 4,059,947, Cl. 57-58.890.
Stal-Laval Turbin AB: *See—*
Olsson, Karl Olof; and Wildheim, Jorgen, 4,060,707, Cl. 219-121.0LM.
Stamford, Xerox Corporation: *See—*
Frechette, Kenneth R., 4,060,162, Cl. 197-53.000.
Standard Oil Company, The: *See—*
Miller, Arthur F.; Zagata, Robert J.; and Grasselli, Robert K., 4,060,545, Cl. 560-208.000.
Standard Oil Company (Indiana): *See—*
Yahnke, Robert L., 4,060,566, Cl. 260-677.00A.
Standard Register Company, The: *See—*
Maierson, Theodore, 4,060,262, Cl. 282-27.500.
Stange, Klaus K.; and Hamlin, Thomas J., to Xerox Corporation. Cassette loaded sheet feeder for reproduction machine. 4,060,233, Cl. 271-160.000.
Stanley, Lester N.; and Farris, Russell E., to GAF Corporation. N-2-[N-(keto-tert-alkyl carbamyl)alkyl]phenylamines. 4,060,544, Cl. 260-465.00D.
Starcevic, Mihailo, to BBC Brown Boveri & Company Limited. Rotary electrical machine or vertical construction. 4,060,744, Cl. 310-91.000.
Starks, Charles M., to Continental Oil Company. Method for the preparation of trimethylhydroquinone. 4,060,561, Cl. 260-621.00F.
Starshinova, Larisa Alexandrovna: *See—*
Khromov-Borisov, Nikolai Vasilievich; Torf, Samuil Fedorovich; Cherepanova, Valentina Pavlovna; Danilov, Anatoly Fedorovich; and Starshinova, Larisa Alexandrovna, 4,060,652, Cl. 424-329.000.
Statz, Hermann: *See—*
Pucel, Robert A.; and Statz, Hermann, 4,060,820, Cl. 357-13.000.
Steckler, Robert, to Plastomedical Sciences, Inc. Cationic hydrogels based on hydroxyalkyl acrylates and methacrylates. 4,060,678, Cl. 526-260.000.
Steel Heddle Manufacturing Company: *See—*
Kaufmann, Frank H., 4,060,102, Cl. 139-91.000.
Stein, Charles R.; and Carl, William L., to General Electric Company. Method and apparatus for non-scan matrix addressing of bar displays. 4,060,801, Cl. 340-324.00R.
Steinberg, Jack: *See—*
Girdler, George W., 4,059,853, Cl. 2-152.00A.
Steiner, Adolf, to Daimler-Benz Aktiengesellschaft. Installation for the control of the brake force at wheels of motor vehicles. 4,060,284, Cl. 303-100.000.
Stendel, Wilhelm: *See—*
Enders, Edgar; and Stendel, Wilhelm, 4,060,628, Cl. 424-277.000.
Stenger, M. Antoine; Cousse, Henri; and Mouzin, M. Gilbert, to Pierre Fabre SA. Medicaments having psychotropic properties. 4,060,637, Cl. 424-324.000.
Stern, Philip. Fire alarm device. 4,060,800, Cl. 340-304.000.
Stevens, Henry C.: *See—*
Deli, Joseph; and Stevens, Henry C., 4,060,403, Cl. 71-90.000.
Steverlynck, Patrick A., to N.V. Weefautomaten Picanol. Slay for weaving looms. 4,060,104, Cl. 139-188.00R.
Stewart, S. Alan: *See—*
Funk, Richard S.; Stewart, S. Alan; and Ruff, David L., 4,059,933, Cl. 52-127.000.
Stiko B.V.: *See—*
van der Kolk, Albertus; and Stiller, Johannes-Gerhardus, 4,059,998, Cl. 73-368.200.
Stiller, Johannes-Gerhardus: *See—*
van der Kolk, Albertus; and Stiller, Johannes-Gerhardus, 4,059,998, Cl. 73-368.200.
Stobb, Anton Rudolph; and Stobb, Walter John. Apparatus and method for stacking sheets. 4,060,231, Cl. 271-80.000.
Stobb, Walter John: *See—*
Stobb, Anton Rudolph; and Stobb, Walter John, 4,060,231, Cl. 271-80.000.

Stoev, Stoycho Mitrev; Metodiev, Metodi Stoyanov; Kuzev, Lyubomir Vladimirov; Vedrichkov, Petko Georgiev; Sapunarov, Ivan Mitrev; Vassilev, Vassil Vladimirov; Dimitrov, Spas Petkov; Gasharov, Vihar Assenov; Russev, Sheko Kolev; and Mitrev, Kostadin Georgiev, to Vish Minno-Geoloshki Institute - NIS. Material treating apparatus including pneumo-hydraulic vibrator. 4,060,481, Cl. 209-170.000.

Stokowski, Stanley E.: *See*—
Byer, Norman E.; Stokowski, Stanley E.; and Venables, John D., 4,060,729, Cl. 250-338.000.

Stonner, Hans-Martin: *See*—
Garber, Alfred; Stonner, Hans-Martin; Wiesner, Paul; Sinclair, Alan; and Schmidt, Alfred, 4,060,591, Cl. 423-352.000.

Stork Brabant B.V.: *See*—
Vertegaal, Jacobus Gerardus, 4,060,382, Cl. 8-2.50A.

Storz, Karl. Endoscope with an operating device. 4,060,086, Cl. 128-303.150.

Stouls, Francois-Xavier Antoine: *See*—
Devimeux, Daniel Pierre Yvon; and Stouls, Francois-Xavier Antoine, 4,060,832, Cl. 358-133.000.

Stowe, Milton G.; and Brooks, Barry J., to WPC, Inc. Rod packing. 4,060,249, Cl. 277-24.000.

Strout, Theodore M. Panelling method. 4,060,437, Cl. 156-71.000.

Stubbe, Elie Jozef: *See*—
Carteus, Marc Felix Maurice; De Bruyne, Yvrs Marie Grovgrs; Lemmens, Jean Pierre Gustaaf Rosa; and Stubbe, Elie Jozef, 4,060,057, Cl. 122-451.00R.

Stuckmann, Dieter, to Gewerkschaft Eisenhutte Westfalia. Apparatus for and a method of laying a pipe line. 4,059,965, Cl. 61-105.000.

Stumphauzer, William C.: *See*—
Algeri, Harvey R.; and Stumphauzer, William C., 4,060,052, Cl. 118-2.000.

Sugahara, Yujiro; Noshi, Yoshibumi; Naito, Hiroyuki; and Nakamura, Seiichi, to Mizusawa Kagaku Kogyo Kabushiki Kaisha. Stabilizer composition for chlorine-containing polymers. 4,060,508, Cl. 260-23.0XA.

Sugai Chemical Industry Co., Ltd.: *See*—
Goto, Hideo; Shibamoto, Nobuyori; and Tanaka, Shunsaku, 4,060,559, Cl. 260-620.000.

Sukhorukov, Vasily Vasilievich: *See*—
Rogachev, Viktor Igorevich; Sukhorukov, Vasily Vasilievich; and Shkatov, Petr Nikolaevich, 4,060,760, Cl. 324-2.900.

Sukornick, Bernard: *See*—
Peterson, James Oliver; Sukornick, Bernard; Sweeney, Richard Francis; Nychka, Henry R.; Eibeck, Richard E.; and Berenbaum, Morris B., 4,060,555, Cl. 260-586.00R.

Sumitomo Chemical Company, Limited: *See*—
Kimura, Michio; Inaba, Shigeho; and Yamamoto, Hisao, 4,060,550, Cl. 260-340.50R.
Takahashi, Shigeo; Ito, Michio; Nagasawa, Sakae; and Suzuki, Sigeo, 4,060,120, Cl. 164-35.000.
Yasui, Seimei; and Sato, Hiroshi, 4,060,492, Cl. 252-59.000.

Sumitomo Electric Industries, Ltd.: *See*—
Matsubara, Hironaga; and Yamanouchi, Shousuke, 4,060,659, Cl. 428-379.000.

Sunarrow Koski, Co., Ltd.: *See*—
Kuroda, Yoshiyuki, 4,060,185, Cl. 224-4.00F.

Sundermann, Rudolf, to Bayer Aktiengesellschaft. Aromatic cyanic acid esters. 4,060,541, Cl. 260-453.0AR.

Sundstrand Corporation: *See*—
Linscott, Phillip S., Jr., 4,060,745, Cl. 310-156.000.

Sundstrand Data Control, Inc.: *See*—
Bateman, Charles Donald, 4,060,793, Cl. 340-27.00R.

Surber, John L., Jr. Stamp dispensing apparatus. 4,060,177, Cl. 221-25.000.

Sureau, Robert Frederic Michel: *See*—
Domergue, Annick Marthe Suzanne Simone; and Sureau, Robert Frederic Michel, 4,060,531, Cl. 260-308.00R.

Survival Technology, Inc.: *See*—
Reinhold, Herbert E., Jr., 4,060,079, Cl. 128-145.800.

Suzuki, Jiro: *See*—
Iizuka, Masahiko; Suzuki, Jiro; and Kobayashi, Sigeyasu, 4,060,457, Cl. 195-127.000.

Suzuki, Matsumi; Morino, Tetsuro; and Yokota, Shozo, to Fuji Xerox Co., Ltd. Speech recognition method and apparatus adapted to a plurality of different speakers. 4,060,694, Cl. 179-1.0SD.

Suzuki, Matsumi; Kataoka, Hiroyuki; and Ueno, Keiichi, to Fuji Xerox Co., Ltd. Speaker identification system using peak value envelop lines of vocal waveforms. 4,060,695, Cl. 179-1.0SB.

Suzuki, Sigeo: *See*—
Takahashi, Shigeo; Ito, Michio; Nagasawa, Sakae; and Suzuki, Sigeo, 4,060,120, Cl. 164-35.000.

Suzuki, Taneko, to Tokai Regional Fisheries Research Laboratory. Concentrated proteinaceous food material from marine animal meat. 4,060,642, Cl. 426-104.000.

Swager, William E. Clamping device with locking trigger arm. 4,059,871, Cl. 24-134.00R.

Swaminathan, Krishnaiyer, to American Optical Corporation. Achromatic aplanatic condenser. 4,060,306, Cl. 350-87.000.

Sweeney, Richard F.; and Peterson, James O., to Allied Chemical Corporation. Preparation of 1,1,1-trifluoro-2,2-dichloroethane. 4,060,469, Cl. 204-163.00R.

Sweeney, Richard Francis: *See*—
Peterson, James Oliver; Sukornick, Bernard; Sweeney, Richard Francis; Nychka, Henry R.; Eibeck, Richard E.; and Berenbaum, Morris B., 4,060,555, Cl. 260-586.00R.

Swoager, Jon R., to Automation Equipment, Inc. Convertible rail-highway shuttle car. 4,060,035, Cl. 105-177.000.

System Development Corporation: *See*—
Magenheim, Bertram, 4,060,212, Cl. 244-134.00D.

Szymanski, Edward: *See*—
Raff, Frederick L.; and Szymanski, Edward, 4,060,339, Cl. 417-2.000.

Tachihara, Noribumi; Mizohata, Yukio; and Makita, Jun-ichi, to Copal Company Limited. Light diffusing device. 4,059,916, Cl. 40-130.00K.

Taiyo Kogyo Company Limited: *See*—
Nohmura, Ryotaro; Tazaki, Eiji; and Sato, Akio, 4,060,119, Cl. 160-266.000.

Takada, Juichiro, to Takata Kojyo Co., Ltd. Retraction locking safety belt retractor. 4,060,211, Cl. 242-107.700.

Takahashi, Hirokazu: *See*—
Tashiro, Norio; and Takahashi, Hirokazu, 4,060,750, Cl. 315-39.510.

Takahashi, Shigeo; Ito, Michio; Nagasawa, Sakae; and Suzuki, Sigeo, to Matsumoto Dental College; and Sumitomo Chemical Company, Limited. Investment casting process of chromium-cobalt and/or nickel alloys. 4,060,120, Cl. 164-35.000.

Takahashi, Shinobu: *See*—
Nakatsukasa, Kazuo; Murata, Kazuo; Ohkubo, Tetsuo; Yurugi, Masayoshi; and Takahashi, Shinobu, 4,060,851, Cl. 364-900.000.

Takahashi, Teruo: *See*—
Naka, Kiyomi; and Takahashi, Teruo, 4,060,656, Cl. 428-355.000.

Takami, Akihiro; Kuroda, Takayuki; Nagano, Katsuo; and Matsuoka, Michio, to Matsushita Electric Industrial Co., Ltd. Voltage-dependent resistor. 4,060,661, Cl. 428-432.000.

Takano, Hiroshi: *See*—
Shimizu, Kazufusa; Katsumori, Shigeo; Nishikawa, Tadaaki; Senoo, Keisaku; Sakamaki, Kenji; Fujita, Makio; Tano, Teruo; Takano, Hiroshi; and Komori, Hideo, 4,060,390, Cl. 23-259.100.

Takasuga, Kenji, to Kewpie Kabushiki Kaisha; and Toyo Shokuhin Kikai Kabushiki Kaisha. Method and system for preventing containerless discharging of filling material in container filling apparatus. 4,060,106, Cl. 141-1.000.

Takata Kojyo Co., Ltd.: *See*—
Takada, Juichiro, 4,060,211, Cl. 242-107.700.

Takeda Chemical Industries, Ltd.: *See*—
Sato, Yukio; Wada, Seijun; and Matsuzawa, Shigetaka, 4,060,597, Cl. 424-12.000.

Takei, Akira: *See*—
Togei, Ryoiku; Takei, Akira; Hika, Yoshihiko; and Wada, Kunihiko, 4,060,796, Cl. 365-183.000.

Takeuchi, Masato: *See*—
Kawagoshi, Hiroshi; Takeuchi, Masato; and Nakajima, Fumito, 4,060,498, Cl. 252-373.000.

Talsma, Tjitte: *See*—
Corbeij, Peter H. J.; and Talsma, Tjitte, 4,060,836, Cl. 358-248.000.

Tamminen, Pentti Juuse. Alkaline flat cell battery. 4,060,670, Cl. 429-154.000.

Tanaka, Akio, to Zenith Radio Corporation. Memory tuning system with dual speed programming. 4,060,768, Cl. 325-464.000.

Tanaka, Shunsaku: *See*—
Goto, Hideo; Shibamoto, Nobuyori; and Tanaka, Shunsaku, 4,060,559, Cl. 260-620.000.

Tano, Teruo: *See*—
Shimizu, Kazufusa; Katsumori, Shigeo; Nishikawa, Tadaaki; Senoo, Keisaku; Sakamaki, Kenji; Fujita, Makio; Tano, Teruo; Takano, Hiroshi; and Komori, Hideo, 4,060,390, Cl. 23-259.100.

Tapp, Frederick, to Karl Kroyer St. Anne's Limited. Apparatus for dry forming a layer of fiber. 4,060,360, Cl. 425-83.000.

Tasch, Al F., Jr; Frye, Robert Charles; Fu, Horng-Sen; and Brodersen, Robert W., to Texas Instruments Incorporated. Charge coupled device random access memory. 4,060,738, Cl. 307-238.000.

Tashiro, Norio; and Takahashi, Hirokazu, to Tokyo Shibaura Electric Co., Ltd. Compact magnetron with small axial length and slot antenna output attached thereto. 4,060,750, Cl. 315-39.510.

Tassone, Joseph V.: *See*—
Santos, John J., Jr.; and Tassone, Joseph V., 4,059,861, Cl. 12-145.000.

Tatsuno, Kenzou: *See*—
Asari, Akira; and Tatsuno, Kenzou, 4,059,896, Cl. 29-403.000.

Tauscher, Manfred: *See*—
Credner, Karl; Geisel, Berthold; Brenner, Gunter; and Tauscher, Manfred, 4,060,617, Cl. 424-253.000.

Taylor-Brown, Terence John; Calver, Paul Newton; and Jack, James, deceased (by Jack, Margaret, administratrix), to Union Carbide Corporation. Surface coating process. 4,060,648, Cl. 427-32.000.

Taylor, Oren M. Trailer hitch for a tobacco harvester. 4,059,941, Cl. 56-27.500.

Tazaki, Eiji: *See*—
Nohmura, Ryotaro; Tazaki, Eiji; and Sato, Akio, 4,060,119, Cl. 160-266.000.

Tazuma, James J.; and Bergomi, Angelo, to Goodyear Tire & Rubber Company, The. Method of reducing α-acetylene content of hydrocarbon. 4,060,567, Cl. 260-681.50C.

Technigaz: *See*—
Kotcharian, Michel, 4,060,263, Cl. 285-47.000.

Tecneco S.p.A.: *See*—
Tirabassi, Tiziano; Giovanelli, Giorgio; Cesari, Giulio; Bonafe, Ubaldo; and Antisari, Ottavio Vittori, 4,060,326, Cl. 356-96.000.

Teijin Limited: *See*—
Kuratsuji, Takatoshi; Kawase, Shoji; and Shima, Takeo, 4,060,516, Cl. 260-75.00T.
Naka, Kiyomi; and Takahashi, Teruo, 4,060,656, Cl. 428-355.000.

Uchiyama, Shuichi; Utsunomiya, Satoshi; and Watase, Hideo, 4,060,451, Cl. 162-157.00R.
Telefonaktiebolaget L M Ericsson: *See—*
Magnusson, Sten Evert, 4,060,700, Cl. 179-28.000.
Tenneco Chemicals, Inc.: *See—*
Cinco, Salvatore A., 4,060,535, Cl. 260-414.000.
Ternikova, Tamara Alexandrovna: *See—*
Savin, Nikolai Ivanovich; Ternikova, Tamara Alexandrovna; Filippov, Vladimir Jurievich; and Shiryaev, Vladimir Ivanovich, 4,060,127, Cl. 165-145.000.
Tessler, Martin M., to National Starch and Chemical Corporation. Preparation of cationic starches and cathionic starches thus produced. 4,060,683, Cl. 536-50.000.
Teti, John J., to Pyott-Boone Machinery Corporation. Combined accelerator and brake assembly. 4,060,144, Cl. 180-77.00R.
Tetra Pak International AB: *See—*
Balla, Gyula, 4,060,443, Cl. 156-380.000.
Texaco Development Corporation: *See—*
Naylor, Carter G.; and Yeakey, Ernest L., 4,060,501, Cl. 252-548.000.
Texaco Inc.: *See—*
Castagnos, Leonce F., Jr.; and Pratt, Roy E., 4,060,395, Cl. 23-288.00B.
Dowling, Donald J.; and Schoen, William, 4,059,987, Cl. 73-61.10R.
Macaluso, Anthony, Sr.; and Kuntschik, Lawrence F., 4,060,557, Cl. 260-604.0HF.
Powers, John R., 4,059,877, Cl. 29-157.00R.
Texaco Trinidad, Inc.: *See—*
Hart, Joseph I., 4,060,130, Cl. 166-312.000.
Texas Instruments Incorporated: *See—*
Gosney, William Milton, 4,060,737, Cl. 307-221.00D.
Jones, James J., 4,060,285, Cl. 303-106.000.
Meadows, Robert Alan, 4,060,839, Cl. 360-99.000.
Tasch, Al F., Jr; Frye, Robert Charles; Fu, Horng-Sen; and Brodersen, Robert W., 4,060,738, Cl. 307-238.000.
Textron Inc.: *See—*
Chmura, William J.; Slusarski, Ronald S.; and Burk, Charles B., 4,059,879, Cl. 29-148.40R.
Theis, James V., Jr.; McCord, John B.; and Holly, Harry H., to Hollymatic Corporation. Fluid engine. 4,060,336, Cl. 415-80.000.
Theysohn, Ernestine, administratrix: *See—*
Theysohn, Helmuth; and Theysohn, Ernestine, administratrix, 4,060,368, Cl. 425-376.00B.
Theysohn, Helmuth; and by Theysohn, Ernestine, administratrix. Flat-sheet injection head. 4,060,368, Cl. 425-376.00B.
Thiele, Alfred W.: *See—*
Pekrul, Paul J.; and Thiele, Alfred W., 4,060,716, Cl. 364-576.000.
Thiokol Corporation: *See—*
Paul, Henry Neil, 3rd, 4,060,570, Cl. 260-889.000.
Thomas, George L., to General Electric Company. High-temperature glass composition. 4,060,423, Cl. 106-52.000.
Thompson, Arnold M., to Gold Lode, Inc. Ski-renovating or conditioning tool. 4,060,013, Cl. 76-83.000.
Thorp, Lawrence D.: *See—*
Jacobowitz, Lawrence; Mathisen, Einar S.; and Thorp, Lawrence D., 4,060,327, Cl. 356-96.000.
Thumm, Hans: *See—*
Hartmann, Achim; Kulling, Achim; and Thumm, Hans, 4,060,584, Cl. 423-149.000.
Thyssen Edelstahlwerke Aktiengesellschaft: *See—*
Brandis, Helmut; Von Den Steinen, Albert; and Engineer, Serosh, 4,060,431, Cl. 148-36.000.
Tiersten, Harry Frank; and Smythe, Robert Chastain, to Piezo Technology Inc. Guided elastic surface wave filter. 4,060,777, Cl. 333-72.000.
Tilley, Leslie Joseph; and Dugdale, Bernard, to Forth Instruments Limited. Apparatus for measuring irregular areas and thicknesses. 4,060,734, Cl. 250-560.000.
Timochko, Michael J.: *See—*
Kerr, John L.; and Timochko, Michael J., 4,060,810, Cl. 343-700.0MS.
Tirabassi, Tiziano; Giovanelli, Giorgio; Cesari, Giulio; Bonafe, Ubaldo; and Antisari, Ottavio Vittori, to Tecneco S.p.A. Optical instrument for measuring concentrations of polluting gases on long and short geometrical paths. 4,060,326, Cl. 356-96.000.
Tobe, Akihiro: *See—*
Kikumoto, Ryoji; Tobe, Akihiro; Tonomura, Shinji; and Ikoma, Hidenobu, 4,060,612, Cl. 424-248.520.
Kikumoto, Ryoji; Tobe, Akihiro; Tonomura, Shinji; and Ikoma, Hidenobu, 4,060,641, Cl. 424-330.000.
Tobiasson, John R. Container lid-spoon combination. 4,060,176, Cl. 220-212.000.
Togei, Ryoiku; Takei, Akira; Hika, Yoshihiko; and Wada, Kunihiko, to Fujitsu Limited. Semiconductor memory device. 4,060,796, Cl. 365-183.000.
Tokai Regional Fisheries Research Laboratory: *See—*
Suzuki, Taneko, 4,060,642, Cl. 426-104.000.
Tokiwa, Taisuke: *See—*
Hirayama, Kazuhiro; Sato, Yasushi; Tokiwa, Taisuke; Kawakubo, Kazuo; Iwatate, Fujio; and Nakatsui, Hisashi, 4,060,322, Cl. 355-60.000.
Hirayama, Kazuhiro; Sato, Yasushi; Tokiwa, Taisuke; Iwatate, Fujio; Kawakubo, Kazuo; and Nakatsui, Hisashi, 4,060,323, Cl. 355-60.000.
Tokuda, Shingo: *See—*
Yokota, Noriyuki; Tokuda, Shingo; Ito, Yoshiro; and Itaya, Kenji, 4,060,465, Cl. 204-128.000.
Tokura, Yukio: *See—*
Doi, Yasuhiko; Tokura, Yukio; and Imaizumi, Koji, 4,060,320, Cl. 355-3.00R.
Tokyo Shibaura Electric Co., Ltd.: *See—*
Hata, Masaaki; and Wada, Sotaro, 4,060,773, Cl. 332-19.000.
Matsuki, Koji, 4,060,802, Cl. 340-324.00M.
Tashiro, Norio; and Takahashi, Hirokazu, 4,060,750, Cl. 315-39.510.
Yamada, Hisashi; and Horiko, Yoshinori, 4,060,772, Cl. 331-116.00R.
Tomiita, Kazuo: *See—*
Negishi, Takao; and Tomiita, Kazuo, 4,059,950, Cl. 57-140.00J.
Tomita, Kazuo; Murakami, Tadashi; Yamazaki, Yoshio; and Honma, Toyokuni, to Sankyo Company Limited. Isoxazolone derivatives, their preparation and their use as plant growth regulators. 4,060,402, Cl. 71-76.000.
Tomita, Tomiichi, to Sanwa Seiki Kabushiki Kaisha. Sprinkler head. 4,060,201, Cl. 239-553.000.
Tomizawa, Masaharu: *See—*
Akimoto, Minoru; and Tomizawa, Masaharu, 4,060,353, Cl. 418-102.000.
Tomkiewicz, Thaddeus K., to Molex Incorporated. Zero insertion force printed circuit board edge connector assembly. 4,060,295, Cl. 339-17.0LC.
Tonomura, Shinji: *See—*
Kikumoto, Ryoji; Tobe, Akihiro; Tonomura, Shinji; and Ikoma, Hidenobu, 4,060,612, Cl. 424-248.520.
Kikumoto, Ryoji; Tobe, Akihiro; Tonomura, Shinji; and Ikoma, Hidenobu, 4,060,641, Cl. 424-330.000.
Toray Industries, Inc.: *See—*
Negishi, Takao; and Tomiita, Kazuo, 4,059,950, Cl. 57-140.00J.
Torf, Samuil Fedorovich: *See—*
Khromov-Borisov, Nikolai Vasilievich; Torf, Samuil Fedorovich; Cherepanova, Valentina Pavlovna; Danilov, Anatoly Fedorovich; and Starshinova, Larisa Alexandrovna, 4,060,652, Cl. 424-329.000.
Towmotor Corporation: *See—*
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Toyo Shokuhin Kikai Kabushiki Kaisha: *See—*
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Takasuga, Kenji, 4,060,106, Cl. 141-1.000.
Toyo Soda Manufacturing Co., Ltd.: *See—*
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Toyosawa, Koki: *See—*
Harumiya, Akinori; and Toyosawa, Koki, 4,060,795, Cl. 364-900.000.
Toyota Jidosha Kogyo Kabushiki Kaisha: *See—*
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Carlson, David Emil; and Tracy, Chester Edwin, 4,060,660, Cl. 428-408.000.
Tratz, Herbert; Kelp, Fritz; and Netsch, Erich, to Kraftwerk Union Aktiengesellschaft. Feedwater preheater with two steam chambers. 4,060,124, Cl. 165-110.000.
Tremain, David L.; Beach, Burt L.; and Hadley, James C., to Houdaille Industries, Inc. Automatic auxiliary jet sump pump. 4,060,341, Cl. 417-182.500.
Treptow, Wolfram; and Wunsch, Gerd, to BASF Aktiengesellschaft. Anode for electrochemical processes. 4,060,476, Cl. 204-290.00F.
Tress, Norwood E.; and Orsinger, Winston A., to Bell & Howell Company. Pull-foot feed. 4,060,228, Cl. 271-14.000.
Triangle Package Machinery Co.: *See—*
Connors, Robert Harvey, 4,060,736, Cl. 307-141.000.
Trimble, David Lee; Copley, Russell Dean; Jensen, James Keith; and Schlueter, Francis Edward, to Deere & Company. Cotton harvester. 4,059,942, Cl. 56-30.000.
Trolle, Sten; and Jonson, Ake, to AB Carbox. Isostatic press. 4,060,359, Cl. 425-78.000.
Trott, David H., to Crossbow, Inc. Meat thermometer. 4,059,997, Cl. 73-352.000.
True, Howard D. F., Jr., to General Electric Company. Airflow distribution arrangement for a side-by-side refrigerator. 4,059,966, Cl. 62-414.000.
TRW Inc.: *See—*
Merz, Kenneth M.; and Shapiro, Howard E., 4,060,663, Cl. 428-428.000.
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Tsubuko, Kazuo; Kimura, Taro; Hashimoto, Junichiro; and Kurotori, Tsuneo, to Ricoh Co., Ltd. Liquid electrostatic developer. 4,060,493, Cl. 252-62.10L.
Tsuchiya, Osamu: *See—*
Umezawa, Hamao; Umezawa, Sumio; Tsuchiya, Osamu; Akita, Eiichi; Miyazawa, Takeo; Horiuchi, Yukio; and Fukatsu, Shunzo, 4,060,682, Cl. 536-10.000.
Tsukamoto, Kotaro. Coil holding device. 4,060,209, Cl. 242-54.00R.
Tsutsui, Katsuhiko; Miura, Heihachi; and Miyano, Yukio, to Honda Giken Kogyo Kabushiki Kaisha. Carburetor choke valve control system apparatus. 4,060,062, Cl. 123-75.00B.
Turner, John W., Jr., to Joy Manufacturing Company. Power tong. 4,060,014, Cl. 81-57.200.

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Turner Research, Inc.: *See*—
Turner, William F., 4,060,060, Cl. 123-43.00A.
Turner, Warren E.: *See*—
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Turner, William F., to Turner Research, Inc. Valving system for compressors, engines and the like. 4,060,060, Cl. 123-43.00A.
U. Scharer Sohne AG, (USM): *See*—
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Uchikuga, Saburo; and Kuroki, Masataka, to Sogo Pharmaceutical Company Limited. Method of producing pantethine. 4,060,551, Cl. 260-561.00S.
Uchiyama, Shuichi; Utsunomiya, Satoshi; and Watase, Hideo, to Teijin Limited. Polyamide-imide and mica pulp particles and paper-like sheets made therefrom. 4,060,451, Cl. 162-157.00R.
Ucikawa, Hiroshi: *See*—
Harada, Yutaka; Itai, Noriyuki; Ucikawa, Hiroshi; Kato, Hajime; Sato, Katutoshi; and Itoh, Akira, 4,060,425, Cl. 106-90.000.
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Ueno, Keiichi: *See*—
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Uhlarik, William J., to International Telephone and Telegraph Corporation. Fluid leak detector. 4,059,984, Cl. 73-40.50R.
Uhlirsch, Kurt; and Lindhuber, Hermann, to Vereinigte Metallwerke Ranshofen-Berndorf Aktiengesellschaft. Cooling tower and wall structure therefor. 4,060,575, Cl. 261-111.000.
Ultra-Centrifuge Nederland N.V.: *See*—
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Umeda, Hiroyuki, to Victor Company of Japan, Limited. Recording and/or reproducing apparatus having adjustable tape guide mechanism. 4,060,840, Cl. 360-130.000.
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Umezawa, Sumio: *See*—
Umezawa, Hamao; Umezawa, Sumio; Tsuchiya, Osamu; Akita, Eiichi; Miyazawa, Takeo; Horiuchi, Yukio; and Fukatsu, Shunzo, 4,060,682, Cl. 536-10.000.
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Rosemund, Walter Richard; and Rose, Charles Vincent, 4,060,439, Cl. 156-78.000.
Smith, George Edwin, 4,060,167, Cl. 198-622.000.
Taylor-Brown, Terence John; Calver, Paul Newton; and Jack, James, deceased, 4,060,648, Cl. 427-32.000.
Union Oil Company of California: *See*—
Bernard, George G., 4,060,490, Cl. 252-8.55D.
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Hass, Robert H.; and Gibson, Michael H., 4,060,589, Cl. 423-244.000.
Unisearch Limited: *See*—
Edwards, Ronald Alexander Nixon; and Manrique, Jorge, 4,060,203, Cl. 241-7.000.
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United States of America
Army: *See*—
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Lohrmann, Dieter, 4,060,767, Cl. 325-363.000.
Walters, David F., 4,060,170, Cl. 214-331.000.
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Raff, Samuel J., 4,060,790, Cl. 340-3.00R.
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Sherwood, Theodore R., 4,059,890, Cl. 29-739.000.
Speiser, Jeffrey M., 4,060,850, Cl. 364-819.000.
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Corbeij, Peter H. J.; and Talsma, Tjitte, 4,060,836, Cl. 358-248.000.
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Meermans, Jos Louis Hubert, 4,060,838, Cl. 360-96.000.
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United States Surgical Corporation: *See*—
Noiles, Douglas G., 4,060,089, Cl. 128-325.000.
United Technologies Corporation: *See*—
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University of California, The Regents of the: *See*—
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Bergeron, Clifton G.; and Herron, Lester W., 4,060,662, Cl. 428-450.000.
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Urciuoli, John P.; and Icart, Roger P., to Raytheon Company. Recorder with edge-guided belt. 4,060,814, Cl. 346-139.00A.
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Chandrasekaran, Santosh Kumar; Urquhart, John; and Shaw, Jane Elizabeth, 4,060,084, Cl. 128-260.000.
Ushio, Shintaro: *See*—
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Utsunomiya, Satoshi: *See*—
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Kotzsch, Hans Joachim; Vahlensieck, Hans-Joachim; and Seiler, Claus-Dieter, 4,060,538, Cl. 260-448.80R.
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Valdettaro, Alarico A., to Sarkes Tarzian, Inc. Indicator simulating a seven-segment readout device. 4,060,051, Cl. 116-124.10A.
Valleylab, Inc.: *See*—
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Vallourec (Usines a Tubes de Lorraine-Escaut et Vallourec Reunies): *See*—
Verdickt, Jacques, 4,060,727, Cl. 250-358.00P.
van Barneveld, Willem: *See*—
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Janssen, Paul Adriaan Jan; Van Daele, Georges Henri Paul; and Boey, Jozef Martin, 4,060,528, Cl. 260-295.00R.
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Van Royen, Freddy Ghisleen; Mertens, Ludovicus Maria; and Van Den Houte, Jozef Willy, 4,060,416, Cl. 96-48.00R.
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van der Kolk, Albertus; and Stiller, Johannes-Gerhardus, to Stiko B.V. Gas pressure thermometer, and apparatus for application in a gas pressure thermometer. 4,059,998, Cl. 73-368.200.
van der Lely, Cornelis. Soil cultivating implements. 4,060,134, Cl. 172-59.000.
VanderVelden, Richard J., to Medtronic, Inc. Battery seal for encapsulatable cell. 4,060,671, Cl. 429-174.000.
VanDrunen, Gerrit: *See*—
Mazzei, Peter J.; and VanDrunen, Gerrit, 4,060,413, Cl. 75-208.00R.
van Heel, Hubertus Johannes Gerardus; Bruins, Victor Leonard; and Smid, Joost, to Ultra-Centrifuge Nederland N.V. Apparatus for precipitating and separating a material in a solid form from a gaseous mixture. 4,060,391, Cl. 23-264.000.
Van Helden, Henricus J. A.: *See*—
Buiter, Pieter; van der Burgt, Maarten J.; and Van Helden, Henricus J. A., 4,060,397, Cl. 48-197.00R.
van Heyningen, Arent H. Kits, to Raytheon Company. Hard clipped beam former. 4,060,792, Cl. 340-6.00R.
Van Hook, Harry Jerrold: *See*—
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Van Loo, William Rudolph, to American Seating Company. Flame-resistant cushion. 4,060,280, Cl. 297-452.000.
van Nunen, Petrus J. M.; and van Barneveld, Willem, to Oce-van der Grinten, N.V. Electrophotographic process. 4,060,415, Cl. 96-1.800.
van Rosmalen, Gerard Eduard: *See*—
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Vargo, Joseph, Jr.; and Davern, John W., to General-Electro Mechanical Corporation. Slug riveting apparatus. 4,060,189, Cl. 227-53.000.

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Varta Batterie Aktiengesellschaft: *See—*
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Vassilev, Vassil Vladimirov: *See—*
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Veeneman, John L.: *See—*
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Verbanac, Frank, to A. E. Staley Manufacturing Company. Starch acrylamides and the method for preparing the same. 4,060,506, Cl. 260-17.4GC.

Verdickt, Jacques, to Vallourec (Usines a Tubes de Lorraine-Escaut et Vallourec Reunies). Method and apparatus for the radiographic inspection of tubes. 4,060,727, Cl. 250-358.00P.

Vereinigte Metallwerke Ranshofen-Berndorf Aktiengesellschaft: *See—*
Uhlirsch, Kurt; and Lindhuber, Hermann, 4,060,575, Cl. 261-111.000.

Verhoeven, Gerardus H. Th. M.: *See—*
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Verner, Bo Lennart; and Fors, Lars Borje Staffan, to Atlas Copco Aktiebolag. Device for lake restoration by oxygen-enriching of the water. 4,060,574, Cl. 261-77.000.

Vertegaal, Jacobus Gerardus, to Stork Brabant B.V. Method and device for dye transfer printing. 4,060,382, Cl. 8-2.50A.

Victor Company of Japan, Limited: *See—*
Iwahara, Makoto; Maruyama, Fumio; Fujiki, Goro; Mori, Toshinori; Hiyama, Norio; and Kikuchi, Mitsuru, 4,060,696, Cl. 179-1.0GQ.
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Vit, Jaroslav, to National Patent Development Corporation. Treating teeth. 4,060,600, Cl. 424-53.000.

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VKI-Rheinhold & Mahla AG, Firma: *See—*
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Vogel, Ignaz, to Ignaz Vogel GmbH und Co. KG-Fahrzeugsitze. Passenger seat structure for vehicles. 4,060,279, Cl. 297-445.000.

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vor der Bruck, Dieter; Sommer, Richard; and Wolfrum, Gerhard, to Bayer Aktiengesellschaft. Benzene-azo-indole dyestuffs. 4,060,521, Cl. 260-165.000.

Voss, Peter, to Siemens Aktiengesellschaft. Light activated thyristor capable of activation by intensity radiation. 4,060,826, Cl. 357-38.000.

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W. R. Grace & Co.: *See—*
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W. Schlafhorst & Co.: *See—*
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Wacker-Chemitronic Gesellshaft fur Elektronik Grundstoffe mbH: *See—*
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Wada, Kunihiko: *See—*
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Wada, Seijun: *See—*
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Wagner, Fritz; Sahm, Hermann; and Keune, Walter Hartmut, to Gesellschaft fur Biotechnologische Forschung mbH, (GBF). Process for the microbial production of L-serine using pseudomonas Sp. DSM 672. 4,060,455, Cl. 195-29.000.

Wagner, Joseph P.: *See—*
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Wagner, Rudolf, to Remswerk Christian Foll und Sohne. Machine for machining bars and tubes. 4,060,334, Cl. 408-126.000.

Waiters, Irene. Protective device. 4,060,293, Cl. 312-284.000.

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Wakatsuki, Susumu, to Rank Xerox Ltd. Lens switching mechanism for use in copying machine. 4,060,324, Cl. 355-60.000.

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Wako, Shigeo: *See—*
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Walker, Leigh E., to Hooker Chemicals & Plastics Corporation. Process for molecular weight lowering of vinyl halide polymers employing saturated carbon to carbon bonded aldehydes. 4,060,677, Cl. 526-88.000.

Walker, Loren H., to General Electric Company. Discharge lamp auxiliary circuit with dI/dt switching control. 4,060,752, Cl. 315-244.000.

Wallace, William J. Tertiary crude oil recovery process. 4,060,128 Cl. 166-249.

Walters, David F., to United States of America, Army. Tire mount-dismount mechanism. 4,060,170, Cl. 214-331.000.

Walters, John P., to Wisconsin Alumni Research Foundation. Metastable argon stabilized arc devices for spectroscopic analysis. 4,060,708, Cl. 219-121.00P.

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Walz, Alfred H.; and Hahn, Paul-Jurgen, to VKI-Rheinhold & Mahla AG, Firma. Device for the manufacture of fibers from fusible materials. 4,060,355, Cl. 425-7.000.

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Ward, Leslie J. Horse-race-simulating parlor or casino game of pure chance. 4,060,246, Cl. 273-135.0AA.

Watanabe, Naohei; and Inoue, Tadaomi, to Fuji Photo Optical Co., Ltd. Automatic iris control means for variable focal length lens system. 4,060,756, Cl. 318-668.000.

Watanabe, Shugo: *See—*
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Watanabe, Tatsuya: *See—*
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Watase, Hideo: *See—*
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Watson, Gerald K.: *See—*
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Watson, Hugh R.; Rowsell, David G.; and Spring, David John, to Wilkinson Sword Limited. Tobacco and tobacco-containing manufactures containing an ingredient having physiological cooling activity. 4,060,091, Cl. 131-9.000.

Watson, John C.; Watson, John D.; and Watson, Gerald K., to Evenheat Kiln, Inc. Shield for pyrometric cones used in ceramic firing kilns. 4,060,381, Cl. 432-247.000.

Watson, John D.: *See—*
Watson, John C.; Watson, John D.; and Watson, Gerald K., 4,060,381, Cl. 432-247.000.

Waxman, Burton H.; and Mourning, Michael C., to GAF Corporation. Phenoxy carbonyl derivatives of a paraphenylenediamine color developer and their use in an image-receiving sheet for color diffusion transfer. 4,060,418, Cl. 96-29.00D.

Wayment, William Ross, to Joy Manufacturing Company. Method of mine backfilling and material therefor. 4,059,963, Cl. 61-35.000.

Weaver, Leslie A.: *See—*
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Webasto-Werk W. Baier GmbH & Co.: *See—*
Bienert, Horst; Jardin, Hans; and Schatzler, Walter, 4,060,274, Cl. 296-137.00G.

Weber, Paul; Mollenkopf, Hans; Henning, Kurt; Heinemann, Otto; Schmits, Heinz-Herbert; Rother, Wolfgang; Ritzmann, Horst; Wurr, Jurgen; Krutzner, Karl, Jr.; Schossler, Werner; Goldmann, Wolf; and Schepers, Georg, to Polysius AG. Methods and apparatus for the heat treatment of fine-grained materials. 4,060,375, Cl. 432-14.000.

Wedemeyer, Karlfried; Kiel, Wolfgang; and Evertz, Werner, to Bayer Aktiengesellschaft. Process for preparing meta-substituted halophenols. 4,060,562, Cl. 260-623.00R.

Weghaupt, Erich, to Kraftwerk Union Aktiengesellschaft. Superconductive exciter winding for the rotor of a turbogenerator and method of production. 4,060,743, Cl. 310-52.000.

Weikel, Donald J., Jr., to Xerox Corporation. Self-lifting vacuum stripper. 4,060,235, Cl. 271-174.000.

Weill, Theodore C. Wear part. 4,059,884, Cl. 29-401.00E.

Weir, W. David: *See—*
Kilbourn, Edward E.; and Weir, W. David, 4,060,636, Cl. 424-322.000.

Weiss, Hans-Peter: *See—*
Jeserich, Wolfgang-Dieter; Cordes, Claus; Seydl, Wolfgang; and Weiss, Hans-Peter, 4,060,518, Cl. 260-78.00L.

Weiss, Martin Joseph: *See—*
Bernady, Karel Francis; Floyd, Middleton Brawner, Jr.; Poletto, John Frank; Schaub, Robert Eugene; and Weiss, Martin Joseph, 4,060,540, Cl. 260-448.80R.

Weitz, Hans-Martin; and Fischer, Rolf, to BASF Aktiengesellschaft. Manufacture of 5-cyanovaleric acid and its esters. 4,060,543, Cl. 260-464.000.

Welch, Aaron Waddington, to Du Pont de Nemours, E. I., and Company. Selective herbicide for evergreen seedlings. 4,060,405, Cl. 71-93.000.

Welle, Hendricus Bernardus Antonius; and Claassen, Volkert, to U.S. Philips Corporation. Aminoethyl oxime ethers having anti-depressive activity. 4,060,631, Cl. 424-304.000.

Westerberg, Gerhard. Scanning apparatus, for producing masks for micro circuits. 4,060,816, Cl. 354-4.000.

Westerwalder Eisenwerk Gerhard KG: *See—*
Gerhard, Helmut, 4,060,174, Cl. 220-23.400.

Westinghouse Canada Limited: *See—*
Mazzei, Peter J.; and VanDrunen, Gerrit, 4,060,413, Cl. 75-208.00R.

Westinghouse Electric Corporation: *See—*
Blinchikoff, Herman J., 4,060,776, Cl. 333-72.000.
Jones, Charles H.; and Skinner, Dale D., 4,060,791, Cl. 340-3.00C.
Litz, Donald C., 4,060,742, Cl. 310-52.000.
Osborne, Robert L., 4,059,960, Cl. 60-646.000.
Palazzolo, Salvatore E.; and McCaskey, Harold O., Jr., 4,060,450, Cl. 162-141.000.
Riffe, Delmar R.; and Young, Robert R., 4,060,342, Cl. 417-284.000.
Schlegel, Earl S., 4,060,825, Cl. 357-38.000.
Woolfson, Martin G., 4,060,830, Cl. 358-126.000.

Weston, Paul George; Jennemann, Glenn A.; and Hutchinson, Thomas Kemp, to Hartman, Milton D. Vapor control spout. 4,060,108, Cl. 141-59.000.

Wettstein, Dennis: *See—*
Zimmerman, Benjamin G., 4,060,255, Cl. 280-478.00R.

White, Dwain M., to General Electric Company. Process for the reduction of color in polyphenylene oxide resins. 4,060,514, Cl. 260-47.0ET.

White, John T. Apparatus for cutting disks from sheets. 4,060,333, Cl. 408-103.000.

Whittam, Thomas Vincent; and Youll, Barry, to Imperial Chemical Industries Limited. Zeolite Nu-1. 4,060,590, Cl. 423-328.000.

Widmann, Marcel, to Borden Products Limited. Foaming apparatus. 4,060,572, Cl. 261-18.00B.

Wieland, Howard N., Jr., to TRW Inc. Tool for applying adhesive material. 4,060,180, Cl. 222-146.0HE.

Wiesner, Paul: *See—*
Garber, Alfred; Stonner, Hans-Martin; Wiesner, Paul; Sinclair, Alan; and Schmidt, Alfred, 4,060,591, Cl. 423-352.000.

Wieting, James H. Apparatus for locating access openings for electrical outlet boxes in covering members. 4,059,905, Cl. 33-180.00R.

Wilczynski, Mieczyslaw, to Motorola, Inc. Fused in-line power connector arrangement. 4,060,303, Cl. 339-147.00R.

Wild, Albrecht: *See—*
Gante, Joachim; Kurmeier, Hans-Adolf; Orth, Dieter; Schacht, Erich; and Wild, Albrecht, 4,060,633, Cl. 424-304.000.

Wildheim, Jorgen: *See—*
Olsson, Karl Olof; and Wildheim, Jorgen, 4,060,707, Cl. 219-121.0LM.

Wilkinson, Eric, to Leigh Products, Inc. Surface bolt. 4,060,266, Cl. 292-148.000.

Wilkinson, Jerome L. Throttle control device. 4,060,008, Cl. 74-488.000.

Wilkinson Sword Limited: *See—*
Watson, Hugh R.; Rowsell, David G.; and Spring, David John, 4,060,091, Cl. 131-9.000.

William H. Rorer, Inc.: *See—*
Diamond, Julius; and Douglas, George H., 4,060,635, Cl. 424-322.000.

Williams, Albert Edward: *See—*
Atia, Ali Ezz Eldin; and Williams, Albert Edward, 4,060,779, Cl. 333-73.00W.

Williams, David Roth, to Franke, Henry L. Refrigerated semitrailer truck for long and local deliveries. 4,060,400, Cl. 62-162.000.

Williams, George C., to Alden Research Foundation. Electrical recorder and belt with styli therefor. 4,060,815, Cl. 346-139.00A.

Williams, Joseph J. Wheelchair hold down assembly. 4,060,271, Cl. 296-65.00R.

Williams, Robert A. Electrical connector. 4,060,299, Cl. 339-48.000.

Williford, Danny Franklin, to No Flame Process, Inc. Cremated remains processor. 4,060,204, Cl. 241-74.000.

Willig, Wolf Rudiger: *See—*
Jantsch, Ottomar; Feigt, Ingmar; and Willig, Wolf Rudiger, 4,060,822, Cl. 357-30.000.

Willingham, James S. Keyboard Guard. 4,060,163, Cl. 197-105.000.

Wilson, Charles Eugene, III, to International Business Machines Corporation. Injection molding same cycle control. 4,060,362, Cl. 425-145.000.

Wilson, Harold R.: *See—*
Haworth, Richard G.; Saylor, Charles J.; and Wilson, Harold R., 4,060,294, Cl. 339-4.000.

Wilson, Norman A.; and Grotepass, Johann, to Morgan Construction Company. Process for forming ferrous billets into finished product. 4,060,428, Cl. 148-12.00R.

Wilson, William. Mixing bar and system. 4,060,224, Cl. 366-169.000.

Wingfield, Perino B.: *See—*
Burks, Howard L., 4,060,111, Cl. 141-231.000.

Wisconsin Alumni Research Foundation: *See—*
Walters, John P., 4,060,708, Cl. 219-121.00P.

Wolfrum, Gerhard: *See—*
vor der Bruck, Dieter; Sommer, Richard; and Wolfrum, Gerhard, 4,060,521, Cl. 260-165.000.

Woodier, George H.; and Mount, Robert E., to Curtiss-Wright Corporation. Sealing grid system for rotary piston mechanism of the Wankel type. 4,060,352, Cl. 418-122.000.

Woods, John Henry; and Graves, Toby R., to Petrolite Corporation. Hydrocarbon polymers. 4,060,569, Cl. 260-683.15R.

Woolfson, Martin G., to Westinghouse Electric Corporation. Volumetric balance video tracker. 4,060,830, Cl. 358-126.000.

Worms, Karl-Heinz: *See—*
Blaser, Bruno; Germscheid, Hans-Gunther; and Worms, Karl-Heinz, 4,060,546, Cl. 260-502.40A.

Worrell, Paul O. Hanging flower pot arrangement. 4,059,920, Cl. 47-67.000.

WPC, Inc.: *See—*
Stowe, Milton G.; and Brooks, Barry J., 4,060,249, Cl. 277-24.000.

Wright, Owen Edgar, to Lucas Industries Limited. Power switching circuit having a Darlington connected transistor pair. 4,060,758, Cl. 323-17.000.

Wulfing, Johann A.: *See—*
Credner, Karl; Geisel, Berthold; Brenner, Gunter; and Tauscher, Manfred, 4,060,617, Cl. 424-253.000.

Wunder, John E., to United Aircraft Products, Inc. Method of making an annular tube-fin heat exchanger. 4,059,882, Cl. 29-157.30A.

Wunsch, Gerd: *See—*
Treptow, Wolfram; and Wunsch, Gerd, 4,060,476, Cl. 204-290.00F.

Wurr, Jurgen: *See—*
Weber, Paul; Mollenkopf, Hans; Henning, Kurt; Heinemann, Otto; Schmits, Heinz-Herbert; Rother, Wolfgang; Ritzmann, Horst; Wurr, Jurgen; Krutzner, Karl, Jr.; Schossler, Werner; Goldmann, Wolf; and Schepers, Georg, 4,060,375, Cl. 432-14.000.

Wyman, Howard John, to Chrysler United Kingdom Limited. Balancing rotors. 4,060,009, Cl. 74-573.00R.

Xerox Corporation: *See—*
Faucz, Eugene C., 4,060,811, Cl. 346-74.100.
Feldeisen, Ronald F.; Minchak, John A.; Gerstman, Richard B.; Meyers, Herbert M.; and Edstrom, Richard C., 4,060,105, Cl. 141-1.000.
Pollack, Joel M.; and Flannery, John B., 4,060,316, Cl. 353-20.000.
Stange, Klaus K.; and Hamlin, Thomas J., 4,060,233, Cl. 271-160.000.
Weikel, Donald J., Jr., 4,060,235, Cl. 271-174.000.

Yahnke, Robert L., to Standard Oil Company (Indiana). Membrane process for separating materials. 4,060,566, Cl. 260-677.00A.

Yamada, Hisashi; and Horiko, Yoshinori, to Tokyo Shibaura Electric Co., Ltd. Oscillator. 4,060,772, Cl. 331-116.00R.

Yamada, Takahiro, to Hitachi, Ltd. Ink jet recording method and apparatus. 4,060,804, Cl. 346-1.000.

Yamada, Takahiro; and Doi, Tetsuo, to Hitachi, Ltd. Ink drop writing apparatus. 4,060,813, Cl. 346-75.000.

Yamaguchi, Yoshitake: *See—*
Matsumoto, Takeshi; Chiba, Kazukiyo; Shioyama, Atsuo; and Yamaguchi, Yoshitake, 4,060,143, Cl. 180-64.00A.

Yamamoto, Hisao: *See—*
Kimura, Michio; Inaba, Shigeho; and Yamamoto, Hisao, 4,060,550, Cl. 260-340.50R.

Yamanouchi, Shousuke: *See—*
Matsubara, Hironaga; and Yamanouchi, Shousuke, 4,060,659, Cl. 428-379.000.

Yamazaki, Yoshio: *See—*
Tomita, Kazuo; Murakami, Tadashi; Yamazaki, Yoshio; and Honma, Toyokuni, 4,060,402, Cl. 71-76.000.

Yanik, LeRoy; and Gross, Dario R., to Midland-Ross Corporation. Air compressor with inlet diversion valve. 4,060,340, Cl. 417-28.000.

Yannas, Ioannis V.; Burke, John F.; Gordon, Philip L.; and Huang, Chor, to Massachusetts Institute of Technology. Multilayer membrane useful as synthetic skin. 4,060,081, Cl. 128-156.000.

Yasui, Seimei; and Sato, Hiroshi, to Sumitomo Chemical Company, Limited. Synthetic saturated oils, and their production and use. 4,060,492, Cl. 252-59.000.

Yavor, Stanley. Caulking gun cartridge opening tool. 4,059,894, Cl. 30-296.00A.

Yeakey, Ernest L.: *See—*
Naylor, Carter G.; and Yeakey, Ernest L., 4,060,501, Cl. 252-548.000.

Yevick, George Johannus, to Personal Communications, Inc. Compact folded mirror recorder and viewer of information. 4,060,317, Cl. 353-27.00R.

Yokota, Noriyuki; Tokuda, Shingo; Ito, Yoshiro; and Itaya, Kenji, to Osaka Soda Co. Ltd. Method of purifying the raw brine used in alkali salt electrolysis. 4,060,465, Cl. 204-128.000.

Yokota, Shozo: *See—*
Suzuki, Matsumi; Morino, Tetsuro; and Yokota, Shozo, 4,060,694, Cl. 179-1.0SD.

Yoshida, Yoshiaki: *See*—
Miyazaki, Tsutomu; Yoshida, Yoshiaki; Ueda, Shozo; Mitsuya, Kinpei; and Ogasawara, Takeshi, 4,060,207, Cl. 242-18.00R.

Yoshikawa, Ikuji; Noro, Yoshihisa; and Okaneya, Junji. Combined reversible aqueous colloidal dental impression material. 4,060,421, Cl. 106-38.50D.

Youll, Barry: *See*—
Whittam, Thomas Vincent; and Youll, Barry, 4,060,590, Cl. 423-328.000.

Young, Robert R.: *See*—
Riffe, Delmar R.; and Young, Robert R., 4,060,342, Cl. 417-284.000.

Young, Roger E.: *See*—
Gomaa, Ezzat E.; and Young, Roger E., 4,060,129, Cl. 166-252.000.

Yue, Hong Jun: *See*—
Nemiroff, Michael; Yue, Hong Jun; and Schevey, William Russell, 4,060,448, Cl. 156-653.000.

Yurugi, Masayoshi: *See*—
Nakatsukasa, Kazuo; Murata, Kazuo; Ohkubo, Tetsuo; Yurugi, Masayoshi; and Takahashi, Shinobu, 4,060,851, Cl. 364-900.000.

Zagata, Robert J.: *See*—
Miller, Arthur F.; Zagata, Robert J.; and Grasselli, Robert K., 4,060,545, Cl. 560-208.000.

Zauhar, Helmut: *See*—
Herzer, Heinz; and Zauhar, Helmut, 4,060,392, Cl. 23-273.0SP.

Zeh, David W.: *See*—
Miller, Gerald V.; and Zeh, David W., 4,060,100, Cl. 138-89.000.

Zenith Radio Corporation: *See*—
Tanaka, Akio, 4,060,768, Cl. 325-464.000.

Zimmerman, Benjamin G., to Wettstein, Dennis, a part interest. Wide range bumper mounted hitch. 4,060,255, Cl. 280-478.00R.

Zinchuk, Michael, to Polaroid Corporation. Tin indium oxide and polyvinylcarbazole layered polarized photovoltaic cell. 4,060,426, Cl. 136-89.0NB.

Ziolko, Francis Joseph, to Devro, Inc. Extruder apparatus for forming a tubular casing. 4,060,361, Cl. 425-131.100.

Zioni, Jacob; Klein, Yitzhak; and Inbar, Dan, to Elscint, Ltd. Scintillation camera for establishing the coordinates of a radiation stimuli produced by a radiation field. 4,060,730, Cl. 250-369.000.

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LIST OF REISSUE PATENTEES

TO WHOM

PATENTS WERE ISSUED ON THE 29TH DAY OF NOVEMBER, 1977

NOTE.—Arranged in accordance with the first significant character or word of the name (in accordance with city and telephone directory practice).

Dual Manufacturing and Engineering, Incorporated: *See*—
Re, Frank Manuel, Re. 29,483, Cl. 297-88.000.

Fluid Devices, Ltd.: *See*—
Larner, Donald Alexander, Re. 29,481, Cl. 137-596.150.

Larner, Donald Alexander, to Fluid Devices, Ltd. Multi-way directional fluid flow control valve arrangement. Re. 29,481, Cl. 137-596.150.

Nippon Electric Company, Limited: *See*—
Utsumi, Kazuaki; Tsubouchi, Norio; and Ohno, Tomeji, Re. 29,484, Cl. 106-73.320.

Ohno, Tomeji: *See*—
Utsumi, Kazuaki; Tsubouchi, Norio; and Ohno, Tomeji, Re. 29,484, Cl. 106-73.320.

Park, Robert H. Method of effecting fast turbine valving for improvement of power system stability. Re. 29,485, Cl. 290-40.00R.

Re, Frank Manuel, to Dual Manufacturing and Engineering, Incorporated. Reclining chair. Re. 29,483, Cl. 297-88.000.

Rosen, Sidney. Container filling system. Re. 29,482, Cl. 141-160.000.

Tsubouchi, Norio: *See*—
Utsumi, Kazuaki; Tsubouchi, Norio; and Ohno, Tomeji, Re. 29,484, Cl. 106-73.320.

Utsumi, Kazuaki; Tsubouchi, Norio; and Ohno, Tomeji, to Nippon Electric Company, Limited. Barium titanate base ceramic composition having a high dielectric constant. Re. 29,484, Cl. 106-73.320.

LIST OF PLANT PATENTEES

Callahan, Claud: *See*—
Silvers, William E., 4,159, Cl. 35.000.

McCormick, Marjorie: *See*—
Silvers, William E., 4,159, Cl. 35.000.

Moore, Ralph S. Miniature rose plant. 4,158, 11-29-77, Cl. 9.000.

Ralph S. Moore. Miniature rose plant. 4,160, 11-29-77, Cl. 9.000.

Silvers, William E., to Callahan, Claud; and McCormick, Marjorie. Apple tree. 4,159, 11-29-77, Cl. 35.000.

LIST OF DESIGN PATENTEES

Abbott Laboratories: *See*—
D'Alo, Herbert Fred, 246,491, Cl. D6-188.000.

AGFA-Gevaert AG: *See*—
Schlagheck, Norbert; and Schultes, Herbert, 246,525, Cl. D16-04.000.

Amerock Corporation: *See*—
Clayton, LaVerne E., 246,501, Cl. D8-320.000.
Clayton, LaVerne E., 246,502, Cl. D8-352.000.
Clayton, LaVerne E., 246,503, Cl. D8-352.000.

Anger, Gary F.; and Sesnak, Joseph C. Beverage container. 246,504, 11-29-77, Cl. D9-28.000.

Bartlett, Robert N., to Windsor Industries, Inc. Combined carpet cleaning wand and head therefor. 246,523, 11-29-77, Cl. D15-63.000.

Blaser, Werner, to Dasu Anstalt. Couch frame. 246,493, 11-29-77, Cl. D6-191.000.

Brewer, James M.: *See*—
Ingram, Orval Gene, 246,532, Cl. D22-30.000.

Brinkley, Mary Ann Paschal. Folding puzzle. 246,544, 11-29-77, Cl. D34-15.00M.

Brockbank, William Henry, to George Kent (Malaysia) Berhad. Air valve for pipelines. 246,533, 11-29-77, Cl. D23-19.000.

Buckley, George F. Flexible support arm for a dental unit. 246,534, 11-29-77, Cl. D24-5.000.

Burleson, Bill M. Doghouse. 246,540, 11-29-77, Cl. D30-1.000.

Clayton, LaVerne E., to Amerock Corporation. Pull. 246,501, 11-29-77, Cl. D8-320.000.

Clayton, LaVerne E., to Amerock Corporation. Escutcheon for a knob. 246,502, 11-29-77, Cl. D8-352.000.

Clayton, LaVerne E., to Amerock Corporation. Escutcheon. 246,503, 11-29-77, Cl. D8-352.000.

Crane, Eugene H. Case for containing items used by engineers, architects and the like. 246,549, 11-29-77, Cl. D87-1.00R.

Cunningham, David Lynn. Combined toothbrush holder and pill dispenser. 246,489, 11-29-77, Cl. D4-18.000.

D'Alo, Herbert Fred, to Abbott Laboratories. Tray for display and storage of flexible bags. 246,491, 11-29-77, Cl. D6-188.000.

Danielson, David Charles, to International Business Machines Corporation. Container for liquids. 246,507, 11-29-77, Cl. D9-175.000.

Dasu Anstalt: *See*—
Blaser, Werner, 246,493, Cl. D6-191.000.

Deputy, Robert John. Boat. 246,517, 11-29-77, Cl. D12-68.000.

Diffenderfer, Walter L.: *See*—
McFarland, Frederick R.; and Diffenderfer, Walter L., 246,512, Cl. D10-64.000.

Dixon, Michael William, to Scientific Hospital Supplies Limited. Microbiological test strip. 246,535, 11-29-77, Cl. D24-8.000.

Dixon, Michael William, to Scientific Hospital Supplies Limited. Microbiological test strip. 246,536, 11-29-77, Cl. D24-8.000.

DuFresne, Clement P., to Fairchild Industries, Inc. Combined chair and collapsible table unit. 246,490, 11-29-77, Cl. D6-31.000.

Fairchild Industries, Inc.: *See*—
DuFresne, Clement P., 246,490, Cl. D6-31.000.

Ferch, Rudolf, to Kastle Gesellschaft m.b.H. Ski. 246,543, 11-29-77, Cl. D34-14.00D.

Figur, Bernd: *See*—
Stuetzer, Franz Alban; and Figur, Bernd, 246,538, Cl. D27-42.000.

Fischer, James Lee; and Payne, George, to Warner Cable Corporation. Subscriber terminal console. 246,520, 11-29-77, Cl. D14-45.000.

Flinn, Robert D.: *See*—
Poulsen, Lance K.; Miller, Richard D.; and Flinn, Robert D., 246,499, Cl. D8-71.000.
Poulsen, Lance K.; Miller, Richard D.; and Flinn, Robert D., 246,500, Cl. D8-71.000.

Gannet Holdings Limited: *See*—
Maclaren, Owen Finlay, 246,518, Cl. D12-128.000.

Garneau, Joseph Laureat. Permanent land survey marker. 246,513, 11-29-77, Cl. D10-66.000.

George Kent (Malaysia) Berhad: *See*—
Brockbank, William Henry, 246,533, Cl. D23-19.000.

Gilbert, Donald E. Wall-type insect electrocutor. 246,531, 11-29-77, Cl. D22-19.000.

Goldman, Arnold: *See*—
Krumin, Donald; and Goldman, Arnold, 246,521, Cl. D14-68.000.

Gordon, Woodford W. Tooth positioner material. 246,537, 11-29-77, Cl. D24-10.000.

Hefendehl, Hans Friedrich: *See*—
Zeischegg, Walter, 246,530, Cl. D19-75.000.

Herk, Charles Robert, to P.P. & D. Pty. Limited. Cassette storage unit. 246,550, 11-29-77, Cl. D87-1.00D.

Honegger, Barbara S. Hands for a timepiece. 246,514, 11-29-77, Cl. D10-127.000.

Hull, Evan B. Life ring. 246,542, 11-29-77, Cl. D34-43.000.

Hytken, Sidney. Toothpaste tube. 246,509, 11-29-77, Cl. D9-194.000.

Ingersoll-Rand Company: *See*—
Uyeda, Tim M., 246,548, Cl. D87-1.00R.

Ingram, Orval Gene, to Brewer, James M. Lure transfer assembly. 246,532, 11-29-77, Cl. D22-30.000.

International Business Machines Corporation: *See*—
Danielson, David Charles, 246,507, Cl. D9-175.000.
Jensen, George B., to Syracuse China Corporation. Cup or similar article. 246,494, 11-29-77, Cl. D7-9.000.
K-D Manufacturing Company: *See*—
McFarland, Frederick R.; and Diffenderfer, Walter L., 246,512, Cl. D10-64.000.
Kastle Gesellschaft m.b.H.: *See*—
Ferch, Rudolf, 246,543, Cl. D34-14.00D.
Kato, Ken, to Sansui Electric Co., Ltd. Head phone. 246,519, 11-29-77, Cl. D14-36.000.
Krimm, John H. Vehicle polishing apparatus. 246,522, 11-29-77, Cl. D15-37.000.
Krumin, Donald; and Goldman, Arnold, to Motorola, Inc. Vehicular communication converter apparatus or similar article. 246,521, 11-29-77, Cl. D14-68.000.
Kurozumi, Shigeru, to Sharp Kabushiki Kaisha. Electrophotographical duplicator. 246,526, 11-29-77, Cl. D16-31.000.
Kushner, David. Lamp. 246,546, 11-29-77, Cl. D48-20.00R.
Lauber, Olley C. Cutting tool. 246,524, 11-29-77, Cl. D15-139.000.
Les Must de Cartier-France: *See*—
Zimmerman, Jacques, 246,488, Cl. D2-427.000.
Libit, Sidney M. Container closure. 246,511, 11-29-77, Cl. D9-267.000.
Lin, Spencer B. T. Plastic bag. 246,510, 11-29-77, Cl. D9-249.000.
Maclaren, Owen Finlay, to Gannet Holdings Limited. Baby carriage. 246,518, 11-29-77, Cl. D12-128.000.
McFarland, Frederick R.; and Diffenderfer, Walter L., to K-D Manufacturing Company. Brake lining gauge. 246,512, 11-29-77, Cl. D10-64.000.
Miller, Luvenia C. Wheeled animal figure toy. 246,545, 11-29-77, Cl. D34-15.00B.
Miller, Richard D.: *See*—
Poulsen, Lance K.; Miller, Richard D.; and Flinn, Robert D., 246,499, Cl. D8-71.000.
Poulsen, Lance K.; Miller, Richard D.; and Flinn, Robert D., 246,500, Cl. D8-71.000.
Miller, Robert Eric, to Miller-Universal (Aust.) Pty. Ltd. Tripod head for cameras or other instruments. 246,528, 11-29-77, Cl. D16-46.000.
Miller-Universal (Aust.) Pty. Ltd.: *See*—
Miller, Robert Eric, 246,528, Cl. D16-46.000.
Montano, Paula J. Cookie cutter. 246,495, 11-29-77, Cl. D7-43.000.
Motorola, Inc.: *See*—
Krumin, Donald; and Goldman, Arnold, 246,521, Cl. D14-68.000.
Myers, David W. Golf club head. 246,541, 11-29-77, Cl. D34-5.0GH.
Nickel, John Wesley. Fluid filled insole for footwear. 246,486, 11-29-77, Cl. D2-318.000.
Nizetich, Andre A. Blow dryer attachment. 246,539, 11-29-77, Cl. D28-18.000.
Nudell, Arthur A. Pill Box. 246,508, 11-29-77, Cl. D9-183.000.
Optronics, Incorporated: *See*—
Payne, Duncan M., 246,547, Cl. D48-24.00R.
Owens-Illinois, Inc.: *See*—
Veasy, John Paul, 246,505, Cl. D9-137.000.
Veasy, John Paul, 246,506, Cl. D9-137.000.
P.P. & D. Pty. Limited: *See*—
Herk, Charles Robert, 246,550, Cl. D87-1.00D.
Payne, Duncan M., to Optronics, Incorporated. Hand held spot light. 246,547, 11-29-77, Cl. D48-24.00R.
Payne, George: *See*—
Fischer, James Lee; and Payne, George, 246,520, Cl. D14-45.000.
Pfefer, Irving S. Vignetting device. 246,527, 11-29-77, Cl. D16-38.000.
Polc, John. Blade for a mortar hoe. 246,498, 11-29-77, Cl. D8-11.000.
Poulsen, Lance K.; Miller, Richard D.; and Flinn, Robert D., to Rajo Motor & Manufacturing Company. Materials handling device. 246,499, 11-29-77, Cl. D8-71.000.
Poulsen, Lance K.; Miller, Richard D.; and Flinn, Robert D., to Rajo Motor & Manufacturing Company. Materials handling device. 246,500, 11-29-77, Cl. D8-71.000.
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Rowenta-Werke, GmbH: *See*—
Stuetzer, Franz Alban; and Figur, Bernd, 246,538, Cl. D27-42.000.
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Kato, Ken, 246,519, Cl. D14-36.000.
Schlagheck, Norbert; and Schultes, Herbert, to AGFA-Gevaert AG. Motion picture camera. 246,525, 11-29-77, Cl. D16-04.000.
Schultes, Herbert: *See*—
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Scientific Hospital Supplies Limited: *See*—
Dixon, Michael William, 246,535, Cl. D24-8.000.
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Sesnak, Joseph C.: *See*—
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V 964/5 NO29 77 UMI

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152 A 4,059,853

CLASS 3

1.91 4,059,854

CLASS 4

172.14 4,059,855
172.17 4,059,856
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CLASS 16

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CLASS 32

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11 4,059,902
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CLASS 33

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174 G 4,059,907
180 R 4,059,905
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CLASS 34

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CLASS 35

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CLASS 36

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CLASS 37

142.5 4,059,911

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130 K 4,059,916

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CLASS 48

197 R 4,060,397

CLASS 49

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CLASS 51

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268 4,059,930

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CLASS 53

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CLASS 55

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244 4,060,399

CLASS 56

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327 A 4,059,943
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400.1 4,059,945

CLASS 57

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149 4,059,951

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21.13 4,059,954
23 R 4,059,955
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90 R 4,059,957

CLASS 60

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670 4,059,961

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CLASS 62

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CLASS 63

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CLASS 64

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CLASS 65

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CLASS 66

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CLASS 68

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23.1 4,059,994
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46 4,059,985
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61.1 R 4,059,987
81 4,059,990
88.5 R 4,059,991
95 4,059,992
178 R 4,059,993
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354 4,059,996
368.2 4,059,998
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421 B 4,060,000
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CLASS 92

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401.1 4,060,032

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CLASS 106

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CLASS 111

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CLASS 113

54 R 4,060,046

CLASS 114

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CLASS 145

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61 G 4,060,115

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7 4,060,116
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CLASS 156

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653 4,060,448

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CLASS 160

266 4,060,119

CLASS 162

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CLASS 164

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CLASS 165

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CLASS 171

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CLASS 173

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CLASS 176

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77 R 4,060,144
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CLASS 182

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151 4,060,150

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52 4,060,152
72.6 4,060,153
73.3 4,060,154
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82 T 4,060,158
113 B 4,060,159
134 4,060,160

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53 4,060,162
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CLASS 198

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446 4,060,166
622 4,060,167

CLASS 200

5 A 4,060,703
35 R 4,060,702
61.62 4,060,704
153 M 4,060,705

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CLASS 202

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CLASS 203

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CLASS 204

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158 R 4,060,468
163 R 4,060,469
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197 4,060,472
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290 F 4,060,476
300 R 4,060,477

CLASS 206

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289 4,060,169

CLASS 208

8 4,060,478
11 R 4,060,479
111 4,060,480

CLASS 209

170 4,060,481
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433 M 4,060,488

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CLASS 215

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CLASS 219

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146 HE 4,060,180
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442 4,060,183
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4 F 4,060,185

CLASS 226

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CLASS 227

9 4,060,188
53 4,060,189

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2 4,060,190
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46 D 4,060,192
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18.1 4,060,208
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134 D 4,060,212
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CLASS 248

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252 4,060,726
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358 P 4,060,727
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345.7 R 4,060,533
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448.8 R 4,060,538
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561 S 4,060,551
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586 R 4,060,555
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620 4,060,559
621 D 4,060,560
621 F 4,060,561
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18 B 4,060,572
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CLASS 264

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CLASS 271

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CLASS 272

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CLASS 273

1 E 4,060,242
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25 4,060,244
85 R 4,060,245
135 AA 4,060,246
157 R 4,060,247

CLASS 274

41.6 R 4,060,248

CLASS 277

24 4,060,249
53 4,060,250

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106 T 4,060,145
461 A 4,060,254
478 R 4,060,255
613 4,060,256
626 4,060,257
638 4,060,258
656 4,060,259
747 4,060,260
756 4,060,261

CLASS 282

27.5 4,060,262

CLASS 285

47 4,060,263
175 4,060,264
405 4,060,265

CLASS 290

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CLASS 296

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93 4,060,272
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137 G 4,060,274

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CLASS 302

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CLASS 303

6 C 4,060,283
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106 4,060,285

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221 D 4,060,737
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319 4,060,739
362 4,060,740

CLASS 308

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73 4,060,288
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216 4,060,290
241 4,060,291

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CLASS 312

247 4,060,292
284 4,060,293

CLASS 313

95 4,060,747
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484 4,060,749

CLASS 315

39.51 4,060,750
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244 4,060,752

CLASS 318

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218 4,060,754
571 4,060,755
668 4,060,756

CLASS 323

17 4,060,758
60 4,060,759

CLASS 324

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123 R 4,060,763
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CLASS 325

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CLASS 331

116 R 4,060,772

CLASS 332

19 4,060,773

CLASS 333

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73 W 4,060,778
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81 A 4,060,780
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Juanita M. Kreps, Secretary

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